THE POLITICAL ECONOMY OF TARIFF POLICY IN THE EUROPEAN UNION

By

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Abstract of Dissertation Presented to the Graduate School
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This dissertation develops a test of different political-economy models and applies it to describe the tariff-determination process in the European Union. Chapter 2 examines tariff determination in the European Community for 100 industries from 1969-89. Tariffs during this period were determined through voting in the Council of Ministers, but how each country votes is not observed. This study then exploits the variation resulting from countries joining the EC to identify the decision rule and the decisive country. Three methods are used to rank countries on the basis of their policy preferences. Results suggest that decisions have been made around the highest percentile, suggesting unanimity or the presence of logrolling. The implications of these results are shown for two industries. It was found that the political equilibrium has in some cases shifted as a result of the enlargements, and no evidence exists that the large countries' ability to be decisive has been affected by the entry of new members.

Chapter 3 looks at the period after the 1987 Single European Act. Since that time, the European Union has been rapidly moving toward closer integration. This study seeks to provide empirical evidence on this phenomenon by examining industry lobbying on

the common tariff from 1987 to 1999. Increased integration implies an increase in pan-European lobbying, so that in a political-economy model, industry characteristics are aggregated across the EU. Using a dataset for 94 manufacturing industries, I test the EU specification against a decisive country framework. Results suggest that the EU is indeed behaving as a country in setting the common tariff.

Chapter 4 is a first attempt at explaining changes in the EU's customs classification. Here I examine whether changes in the number of tariff lines in an industry result from new products or from political-economy considerations, while exploiting the EU enlargements as an additional source of variation. The analysis focuses on 92 manufacturing industries and 12 years, from 1988 (when the Combined Nomenclature was adopted) to 1999. Results suggest that changes in the EU's customs classification do reflect protectionist lobbying.

CHAPTER 1
INTRODUCTION

This dissertation seeks to provide a framework for examining how trade policy is set in the European Union and to show how changes in the institutional setting can affect the way firms lobby for protection. Chapter 2 attempts to determine what voting rule was used in setting tariffs before 1987 and to pinpoint which country was pivotal in that decision. Chapter 3 looks at the post-1987 period to examine whether the EU is behaving as a single country, with interest groups lobbying the European Commission in Brussels; or whether the EU is still acting like a group of countries, with lobbying concentrated in each member country. Finally, Chapter 4 explores a different but related question: do changes in how goods are classified in the EU's tariff schedule occur because of new products in the market or because of protectionist lobbying?

Chapter 2 develops a methodology for determining how European countries vote in the Council of Ministers, the main decision-making body in the EU. Throughout its history, decisions in the EC have been made via unanimity, simple majority, or qualified-majority.[1] As in any political process, logrolling may also take place. However, because decisions in the Council are not observed directly, it becomes necessary to use an indirect method to determine how the decision-making process takes place. To that end, I use the determination of trade protection, and in particular the Common Customs Tariff (CCT), which was adopted in 1968 and which has been decided at the EC-level ever since. The analysis employs a unique dataset containing 100 manufacturing industries from 1969 to 1989, which covers three enlargements. This chapter restricts the sample period to 1989 because until the adoption of the Single European Act (SEA) in 1987, countries were allowed to veto any proposal they deemed to be against their national interest, under the

[1] Qualified majority means that decisions require 71% of the votes in order to be adopted.

Luxembourg Compromise (Hine 1985). The SEA did not abolish the Luxembourg Compromise, but merely suspended its use. Because of this unanimity requirement, interest groups would concentrate their resources and efforts on lobbying their national governments for protection of the industries they represented, since they were able to veto any policy deemed to be against the national interest.

This allows me to model tariff determination in the EC as a two-stage process. In the first stage, interest groups lobby their national governments for protection of the industries they represent. Government then chooses a tariff rate for that industry to maximize a political support function, which becomes the country's preferred tariff rate. In the second stage, countries vote in the Council of Ministers to determine the overall EC tariff rate. This resulting tariff rate, according to a "decisive voter" model, will be the duty preferred by the decisive country. Which country is decisive in turn depends on how decisions are made. If it is unanimity, the decisive country will be the one with the highest or lowest preferred tariffs, since those are the ones most likely to veto any proposal. In the case of majority voting, it will be the country whose preference lies at the median; if it is qualified majority, the decisive country will be the one whose preferred tariff rate lies at the 71^{st} percentile.

Finally, tariff determination could also reflect logrolling, or vote trading. It has been observed that legislators oftentimes vote for legislation against the interests of their constituents, implying the presence of unobserved factors that influence votes. This can occur if legislators are trading away their votes on one issue for votes on another that is of greater concern to their constituents. If one country has a strong preference for a high tariff on one good, and another country wants a high tariff on another good, they could logroll on both tariffs and end up with a higher tariff on both goods. In other words, if the decision rule employed is majority voting, logrolling implies that the decisive country would be the one whose preference lies at a percentile higher than the 50^{th} (such as the 60^{th} percentile). If logrolling occurs with respect to qualified majority, the decisive

country would have a tariff rate lying at a percentile higher than the 71st (for instance, the 80th percentile).

As an identification mechanism for testing these different voting rules, I use the enlargements that have occurred since the adoption of the common tariff. Because the composition of members is changing over time as new countries join the EC, the potential exists for the political equilibrium to change, possibly in favor of a newer member, which provides for an additional source of variation. To actually identify which country is decisive under each voting rule, I use three different methods. The first method consists of choosing the country based on where its industry characteristics fall in the distribution, so that if, for instance, decisions are made at the median, the data used in the regressions are those that fall in the median for each year and each industry. The second method consists of determining which of the industry characteristics best explains tariffs, and then using it to identify the decisive country. This is necessary because different countries might have industry characteristics at the relevant percentile, so that it becomes difficult to determine which one is decisive. The final method consists of using a regression explaining each country's tariff rate from 1958, the year the EC was formed to predict a country's preferred tariff rate (based on current data), or the tariff the country would set if it were not part of the customs union. The decisive country then is the one whose preferred tariff rate lies at the appropriate percentile.

Results suggest that the voting rule used has been at the highest percentile, indicating unanimity, though also suggesting logrolling, as it lies above the 71st percentile. These results are robust throughout the three methods. There is also indication of changes in the political equilibrium due to the enlargements, with the equilibrium shifting in some cases toward the new members at both the industry level and on average, though there is no evidence of shifts in favor of small countries. Finally, I find evidence supporting Krugman's (1991) argument that the larger the customs union, the greater is their market power and hence the higher their tariffs.

Since the 1987 Single European Act (SEA), the European Union has been rapidly moving toward closer integration. Such developments imply that more and more, the EU is resembling a single unified country, rather than a group of countries participating in a customs union. The question that Chapter 3 seeks to answer is, has policy-making indeed moved toward the EU-level? More specifically, it uses a unique dataset to test whether post-SEA tariff setting in the EU reflects pan-European lobby influences or whether the EU is still acting like a collection of separate countries. If the EU is indeed behaving like a single country, we should observe firms from each country lobbying for protection in Brussels. In other words, each EU country would be behaving like a U.S. state, which must lobby Washington for protection, rather than lobbying its state capitals. This means that the appropriate specification in this case would be one similar to the one used to explain U.S. tariffs. If tariffs are assumed to be a function of various political-economy characteristics, this specification requires adding up, for instance, the number of firms in the textile industry in France with the number of firms in that industry in Germany and so forth. On the other hand, if the EU is acting merely like a group of countries, lobbying should occur at the national level, with member countries then bargaining at the Council of Ministers to determine the common tariff. This implies a two-stage process, as in Chapter 2. To answer the question of whether the EU is behaving like a country or a group of countries, then, I test these various decisive-country models against a specification that treats the EU as a single country. The analysis uses a dataset containing 94 manufacturing industries covering the 1987-1999 period, which includes one official enlargement in 1995, and the unification of Germany in 1990, which could also be considered an enlargement.

Results suggest that the EU is indeed behaving like a single country when setting the common tariff. These results are robust to various specification tests and to using different methods for determining the decisive country.

Finally, customs classification is an important element in a country's trade policy. How a good is classified can affect the rate of duty that applies, the coverage of non-tariff barriers, and the formulation and application of rules of origin. Given the number of ways the customs classification can affect trade policy and given how it is constantly altered, it seems reasonable that countries would choose to manipulate the classification for protectionist reasons. It is evident, then, that these changes in the tariff schedule are extremely important in assessing the pattern of protection in a country. This is the topic of Chapter 4, which takes a first pass at explaining these changes and exploring whether they arise out of political-economy considerations—as the anecdotal evidence seems to suggest—or merely from the introduction of new products into the market.

If changes to the classification are a result of lobbying pressure from protectionist interests and it is assumed that any changes result in greater protection for the industry involved, it becomes possible to model the decision-making process in the same way as tariff determination. Given how decisions are made, interest groups can have two potential channels of influence: their national governments or the European Commission. If firms wish to influence decisions in the Nomenclature Committee or the Council of Ministers, they might concentrate their efforts on their national governments, with member countries then bargaining at the committee or the Council to determine the new classification. This implies the decisive-country framework described above. If firms are lobbying the Commission instead, so as to affect policy at the agenda-setting stage, then each EU country would be behaving like a U.S. state, which has to lobby Washington for protection, rather than its state capital. This means that the appropriate specification in this case would be one similar to the one used to explain U.S. tariffs. If changes in classification are assumed to be a function of various political-economy characteristics, this specification requires adding up, for instance, the number of firms in the textile industry in France with the number of firms in that industry in Germany and so forth.

To determine whether changes in the CN result from lobbying with the intent of increasing protection or merely from the existence of new products in the market, I test a model that includes political-economy characteristics and the number of total patent applications in the U.S. (which proxy for the introduction of new products) against one with only the political-economy characteristics and one with only the new-product hypothesis. To account for the different decision rules, I perform the same test for each possible voting rule. The analysis uses a dataset containing 92 manufacturing industries covering the 1988-1999 period, which includes one official enlargement in 1995 and the unification of Germany in 1990, which could also be considered an enlargement. An advantage of using panel data in this case is that these enlargements provide for an additional source of variation. Because we do not observe how countries vote on changes in the classification, it becomes necessary to examine the issue empirically.

Results suggest that changes in the EU's customs classification do in fact reflect protectionist lobbying pressures. These results are robust to various specifications.

CHAPTER 2
WHICH COUNTRY SETS THE TARIFF? THE POLITICAL ECONOMY OF TARIFF DETERMINATION IN THE EUROPEAN COMMUNITY

Introduction

One question that has been hotly debated as the European Community[1] considers expanding its membership to include some of the Central and Eastern European countries is how this enlargement will alter the relative power of member countries. This question has been at the center of every enlargement, as the existing members must decide how many votes to allocate to each of the new countries in the Council of Ministers, the main decision-making body of the EC, while taking into consideration how it would change the distribution of votes. Because the number of votes is based on population, large countries have more votes than small countries, but given how small countries increasingly outnumber large countries, it is quite possible for the political equilibrium to shift in favor of smaller countries. How the entry of new members will affect each country's relative influence depends on what voting rule is used to make decisions, as well as on the alignment of countries based on their policy preferences. These are precisely the questions that this paper seeks to answer.

Decisions in the Council of Ministers, however, are not observed directly, so it becomes necessary to use an indirect method to determine how the decision-making process takes place. To that end, I use the determination of trade protection, and in particular the Common Customs Tariff (CCT), which was adopted in 1968 and which has been decided at the EC-level ever since. Though it could be argued that the CCT is not as

[1] I use the term "European Community" rather than "European Union" throughout this paper not only because the focus is on the pre-1992 period, but also because it is the correct legal term when dealing with trade policy (Messerlin 2001).

important as non-tariff barriers in measuring protection, it was decided to focus on the CCT because until 1992, individual member countries could set non-tariff barriers against other member countries, so that decisions regarding non-tariff barriers were made both at the national and the EC-level.

The analysis uses a unique dataset containing 100 manufacturing industries from 1969 to 1989, which covers three enlargements.[2] It was decided to restrict the sample period to 1989 because until the adoption of the Single European Act (SEA) in 1987, countries were allowed to veto any proposal they deemed to be against their national interest, under the Luxembourg Compromise (Hine 1985). The SEA did not abolish the Luxembourg Compromise, but merely suspended its use. Because of this unanimity requirement, interest groups would concentrate their resources and efforts on lobbying their national governments for protection of the industries they represented, since they were able to veto any policy deemed to be against the national interest. This allows me to model tariff-determination in the EC as a two-stage process, similar to Putnam (1988). In the first stage, interest groups lobby their national governments for protection of the industries they represent. Government then chooses a tariff rate for that industry to maximize a political support function, as in Hillman (1982). This tariff rate becomes the country's preferred tariff rate. In the second stage, countries vote in the Council of Ministers to determine the overall EC tariff rate. This resulting tariff rate, according to a "decisive voter" model, will be the duty preferred by the decisive country.

Which country is decisive in turn depends on how decisions are made. If it is the unanimity rule of the Luxembourg Compromise, the decisive country will be the one with the highest or lowest preferred tariffs, since those are the ones most likely to veto any proposal. In the case of majority voting, it will be the country whose preference lies at the

[2] In 1973, the UK, Ireland, and Denmark joined the founding members, France, Germany, Belgium, Italy, Luxembourg, and the Netherlands; in 1981, Greece became a member; and in 1986, Spain and Portugal entered.

median; if it is qualified majority, the decisive country will be the one whose preferred tariff rate lies at the 71st percentile. Finally, tariff-determination could also reflect logrolling, also known as vote trading. It has been observed that legislators oftentimes vote for legislation against the interests of their constituents, implying the presence of unobserved factors that influence votes. This can occur if legislators are trading away their votes on one issue for votes on another that is of greater concern to their constituents. Previous empirical work on logrolling has focused on identifying logrolling in the U.S. Congress.[3] Stratmann (1992), for instance, estimates a three-equation simultaneous probit model explaining the vote on issues where logrolling is expected to occur. To test for the presence of logrolling, he inserts the predicted vote value for one issue into the regression equation estimating the vote value on another issue. Another test consists of examining whether the residuals of the equations explaining the vote for the issues involved in a logroll are correlated. This paper takes a different, but intuitive approach that is novel in the literature. If one country has a strong preference for a high tariff on one good, and another country wants a high tariff on another good, they could logroll on both tariffs and end up with a higher tariff on both goods. In other words, if the decision rule used is majority voting, logrolling implies that the decisive country would be the one whose preference lies at a percentile higher than the 50th, such as the 60th percentile). If logrolling occurs with respect to qualified majority,[4] the decisive country would have a tariff rate lying at a percentile higher than the 71st (for instance the 80th percentile). This means that I am considering logrolling as another possible decision rule, rather than as a means to pass legislation.

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[3] See Stratmann (1997) for a survey.

[4] The Treaty of Rome (1957) provided for decisions to be made via qualified-majority, meaning that decisions require 71 percent of the votes cast by each country in order to be passed. The Luxembourg Compromise did not change that rule, but merely introduced veto power. With the 1987 SEA, qualified-majority voting was formally re-introduced.

As an identification mechanism for testing these different voting rules, I use the enlargements that have occurred since the adoption of the common tariff. Because the composition of members is changing over time as new countries join the EC, there is a potential for the political equilibrium to change, possibly in favor of a newer member, which provides for an additional source of variation. To actually identify which country is decisive under each voting rule, I use three different methods, none of which have ever been used in the political-economy of trade literature. In all cases, tariffs are assumed to be a function of various political-economic factors. The first method, which is based on Romer and Rosenthal (1982), consists of choosing the country based on where each industry characteristic falls in the distribution, so that if, for instance, decisions are made at the median, the data used in the regressions are those that fall in the median for each year and each industry.[5] The second method consists of determining which of the industry characteristics best explains tariffs, and then using it to identify the decisive country. This is necessary because different countries might have industry characteristics at the relevant percentile, so that it becomes difficult to determine which one is decisive. The final method consists of using a regression explaining each country's tariff rate from 1958, the year the EC was formed to predict a country's preferred tariff rate (based on current data), or the tariff the country would set if it were not part of the customs union. The decisive country then is the one whose preferred tariff rate lies at the appropriate percentile.

Results suggest that the voting rule used has been at the highest percentile, indicating unanimity, though also suggesting logrolling, as it lies above the qualified-majority threshold (71st percentile). These results are robust throughout the three methods. There is also indication of changes in the political equilibrium due to the enlargements, with the equilibrium shifting in some cases toward the new members at

[5] Romer and Rosenthal (1982) searched over percentiles of the income distribution.

both the industry level and on average, though there is no evidence of shifts in favor of small countries. Finally, I find evidence supporting Krugman's (1991) argument that the larger the customs union, the greater is their market power and hence the higher their tariffs.

This work is related to both the political-economy of protection and the public choice literatures. The political-economy literature has focused mainly on explaining the observed structure of protection across industries or countries or over time. Olarreaga et al. (1999) have examined the factors explaining Mercosul's Common External Tariff (CET) to determine whether terms-of-trade effects or political-economy factors better explained the formation of the customs union. They use a specification implying that the CET in a sector is mainly a reflection of the preferences of the country with the highest share of production in that sector. Magee and Lee (2001), for their part, examine the EC's Common Tariff to determine which factors were behind the decline in tariffs after its formation. To my knowledge, though, only one paper has attempted to determine which specification best describes the CET in a customs union. Olarreaga and Soloaga (1998) examine whether Mercosul's CET reflects industry lobbying. They perform a J-test to determine whether the structure of protection can be best explained by a production-weighted average of Mercosul's political-economy variables or any combination of member countries' characteristics. They find that the weighted average of the industry characteristics have a better explanatory power than that using the characteristics of Argentina, Paraguay, or Uruguay separately, or in some combination, but cannot reject the hypothesis that Brazil's political-economy variables are a better predictor of the CET than the production-weighted average. Within the framework of this paper, their results imply that a decisive-country framework might be used in explaining Mercosul's CET, since it seems quite reasonable that Brazil would be the decisive country in that case. Mercosul, however, is still in its infancy as a customs union.

This paper also contributes to the literature on voting power. Several studies recently have examined the distribution of voting power either among all EC member states at one point in time or among an EC after an enlargement. These studies use either the Shapley-Shubik Index or the Banzhaf Index to measure voting power, which is defined, in both cases, as the relative ability of each member state to change a losing coalition into a winning one or vice versa. These papers, however, ignore the alignment of countries based on policy preferences—in fact, no one has attempted to identify which country is decisive in making decisions in the EC and how that has changed over time.

One criticism that could be made against this approach is that focusing attention on the Council is inappropriate. Changes in tariff rates are mainly due to the various GATT trade rounds, and that since it is the Commission that negotiates treaties on behalf of the EC, it would be more accurate to concentrate on the Commission.[6] The Commission, however, is supervised by the Article 113 Committee, on which each country has a seat (Greenway and Hine 1993), meaning that tariff rates still depend on the decisive country. Thus, if decisions are made in the Council, the relative power of any country depends in part on the number of votes it has, implying a weighted framework. If decisions are made by the Commission, however, the number of votes is irrelevant, indicating that a framework where each country has the same weight is more appropriate.

This paper is divided as follows: the next section provides a short background on the decision-making process in the EC and develops a test for determining which political-economy model best explains tariff rates. The third section describes the estimation procedure and the variables used, as well as the predictions. The fourth section

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[6] The European Commission proposes policies and legislation; is responsible for administration; and conducts trade negotiations on behalf of the EC and on the basis of a mandate agreed to by the member governments. As a result, member governments do have some indirect power over Commissioners, as they can refuse to reappoint a Commissioner if he or she does not follow the national position (Widgrèn 1994). Thus, in order for the Commission to achieve anything, it must mediate a compromise between the national governments. In this, it is influenced by a committee of national officials, as well as the residual allegiances of the Commissioners (Winters 1994).

provides the empirical results for the first method, while the fifth section examines the second and third methods, and discusses how the decisive country has changed over time. The last section summarizes the paper.

Theoretical Background

The main decision-making body in the EC during the 1969-89 period was the Council of Ministers. It is made up of ministers from each member state, with different ministers participating in the Council according to the subject under discussion—for instance, Agricultural Ministers discuss farm prices in the Agriculture Council, and Economic and Finance Ministers discuss monetary affairs in the ECOFIN Council. Furthermore, each government acts as president of the council for six months in rotation, thus allowing each country a turn in pursuing its own agenda. And since the EC deals simultaneously in so many areas of policy, it is possible for negotiations to cover a wide variety of topics and thus be subject to logrolling.

In theory, decisions were to be made by qualified-majority voting;[7] in practice, after the 1966 Luxembourg Compromise, which allowed individual countries to veto the proposals they found unacceptable if the matter was judged to be of vital national interest, decisions had to be reached unanimously in order to be approved (Hine 1985). As a result, interest groups during this period concentrated their resources and efforts on lobbying their national governments for protection of the industries they represented, since they were able to veto any policy deemed to be against the national interest. And since members of the Council come from national governments, they are trading off greater political support from industry interests against growing dissatisfaction of voters when raising levels of protection.

Tariff determination in the EC, then, can be modeled as the outcome of a two-stage process. In the first stage, interest groups lobby their national governments for

[7] The proportion of votes required for a qualified majority has remained at about 71 percent.

protection of the industries they represent. These countries are expected to select the tariff that balances the gains of industry votes against the loss of consumer votes at the margin. In the second stage, protection of the concerned industries is voted upon at the Council of Ministers, where a decision is reached via unanimity or qualified majority, or some other voting rule.

Stage One: Interest Groups Lobby National Governments

Recent empirical work on the political-economy of trade policy have used the Grossman and Helpman (1994) model to explain observed patterns of protection.[8] This approach, however, assumes that all lobbying occurs in the form of campaign contributions, thus ignoring the role of information transmission, and other forms of lobbying that are not so directly observed.[9] The Grossman and Helpman model, though, is based on the political-support function approach, first developed by Hillman (1982) and grounded on the Stigler-Peltzman economic theory of regulation. Because it makes no assumption about the type of lobbying that occurs, this model is more appropriate as a basis for examining tariff formation in the EC. Given that tariff-determination is not directly observed in the EC, it becomes necessary to examine the issue empirically. Furthermore, this paper does not focus on explaining the observed pattern of protection. Rather, it uses variables that have been suggested in the literature to test new hypothesis about government decision-making.

Based on the Hillman (1982) model, then, I assume that tariff-setting politicians in each country maximize their overall political support by choosing the tariff rate that produces a politically optimal distribution of the economic rents that can be obtained by the participants in each affected market. In other words, the government in each country selects a vector of tariff rates to maximize a political support function. Letting p_{it} denote the relative price of industry $i=1,...n$ at time t; p_{it}* be the world price of that industry's

[8] Goldberg and Maggi (1999) and Gawande and Bandyopadhyay (2000), for instance.
[9] See Rodrik (1995).

good (so that p_{it}-$p_{it}^* = t_{it}$, the tariff rate on good i at time t) and $\pi_{it}(\cdot)$ be the profit function for that industry, the political support function can be written as

$$PS_{it} = f\left(\pi(p_{it}) - \pi(p_{it}^*), p_{it} - p_{it}^*\right) \quad (1)$$

where the first argument captures the gain in profits resulting from an increase in tariffs and the second term represents the loss in consumer welfare resulting from the higher tariff. Hence, in each EC member country, there are three groups that play a role in setting tariff levels: the owners of the domestic factors of production specific to the production of the commodity (who seek to maximize their profits); the domestic consumers of the commodity (who seek to maximize their utility); and the government (which seeks to maximize political support). The solution to the maximization problem, then, will be the country's preferred tariff rate for the particular commodity in question, which can be written as

$$t_{it} = f(PE_{it}) \quad (2)$$

where PE_{it} denotes the political-economy characteristics that serve as a proxy for an industry's political influence. The structure of the political support function is, like Godek (1985), based on both the economic theory of regulation and comparative advantage. The former suggests which characteristics should influence an industry's ability and efficiency in lobbying for protection, while the latter indicates that industries will have an incentive to lobby if they are at a comparative disadvantage (due to import competition). These are discussed in more detail in the fourth section.

Stage Two: Voting in the Council of Ministers

In the second stage of the model, then, each minister of a member country arrives at the relevant Council meeting with his or her country's preferred tariff level, as determined through lobbying in the first stage. Unlike the standard special interest model, an industry in one country cannot buy votes in another country and thereby alter its preferred tariff rate, so that the only way it can affect the outcome is by lobbying its own government. In other words, an industry in France can only affect France's preferred

tariff rates, not the preferred tariff rates of other countries. Deliberations ensue and, ignoring for the moment the possibility of logrolling, a vote is conducted to determine the overall EC tariff rate. This resulting tariff rate, according to a "decisive voter" model, will be the duty preferred by the decisive country. Which country is decisive in turn depends on how decisions are made. If it is a majority-voting process, the decisive country will be the median. In other words, if decisions are made via majority voting, the tariff rate will be

$$t_{it}^{md} = f\left(PE_{it}^{md}\right) \tag{3}$$

where the superscript *md* denotes the median. Hence, the country whose tariff rate lies at the median will be the one whose political-economy characteristics lie at the median.

Under qualified majority, the decisive country will be the one whose preferred tariff rate lies at the 71st percentile; and if it is unanimity, the decisive country will be the one lying at either end of the distribution. Furthermore, since bargaining tends to occur between countries, tariff-determination could also reflect logrolling. This is illustrated in Table 2-1. Suppose the UK, Portugal and Denmark are the only member countries, and they are voting on increasing the tariff on steel and on textile using simple majority. The payoffs for the three countries on the two tariffs are as shown. If each country votes sincerely, neither tariff increase is passed. Portugal and the UK, however, have a incentive to trade votes, with Portugal agreeing to vote for a tariff increase on steel in exchange for the UK voting for a tariff increase on textiles and vice-versa. With logrolling, then, both tariff increases are adopted, as both the UK and Portugal misrepresent their preferences. Portugal would prefer no tariff increase on textile, which is the median-voter position, but because of the vote-trading, it votes for the increase, which in this case is the extreme position in the distribution. Taking logrolling, then, as another decision rule, if decisions are made via majority voting, logrolling implies that decisions are made at a higher percentile, such as the 60th percentile, whereas if it is

qualified majority voting, they are made at a percentile higher than the 71st (such as the 80th).

Finally, when a country joins the EC, the political equilibrium is potentially altered in that the decisive country changes. This is illustrated, for the median country case, in Figures 2-1 through 2-3, which uses a simple spatial representation of the EC voting process, with the policy preferences of the member countries ordered along a single dimension from free trade ($t_i = 0$) to closed economy ($t_i = \infty$). The positions indicated are not intended to reflect the actual position of each country, but rather to merely illustrate the possible impact of an enlargement. The one assumption that is made throughout is that, in general, large countries prefer higher tariffs than small countries, since small countries tend to be more dependent on foreign trade.

In Figure 2-1, the positions of the original members are shown. If voting in the Council occurs via majority voting, it is seen then that the decisive country is C. Figure 2-2 shows the possible impact of the first and second EC enlargements, which included three small countries (in this case, F, G, and I), and one large (H). This causes the political equilibrium to shift in favor of one of the new entrants, namely, I, and causes tariffs to decline (move closer to free trade). In Figure 2-3, another enlargement occurs, this time including one small (J) and one large (K) country. A new country again becomes the decisive country, while tariffs increase again. If the tariff rates, on the other hand, are supposed to reflect the preferences of the most protectionist country (as would be the case under unanimity), it is seen in this case that the decisive country would remain unchanged throughout the three enlargements.

Estimation

Variables

In order to determine which voting model fits best in explaining the pattern of protection in the European Community, tariff rates are assumed to be a function of various economic and political factors, as in equation (2). The political-economy

characteristics included are the number of firms in the industry, the employment share of sector *i* in the country's total employment, the labor intensity, the wage per worker, intra-industry trade, the import penetration ratio, the change in the import penetration ratio, and the share of exports in the industry's production. For a description of variable construction, see Table 2-2. The sample includes 1100 observations for 100 3-digit NACE industries (listed in Appendix Table A-1) and 11 years (every other year from 1969-89). The 3-digit level was selected because that was the most detailed industry data available for the period under consideration.

Tariffs

The Common Customs Tariff, or CCT, replaced national customs duties on July 1, 1968. All duties on intra-Community trade were also abolished at this time, but non-tariff barriers remained. The CCT was determined mostly by the use of a standard formula that required duties to be "at the level of the arithmetical average of the duties applied in the four customs territories comprised in the Community"[10] (Article 19 (1) of the Treaty of Rome), an average which was calculated taking the duties applied on January 1, 1957, as the basis. For some sensitive products, where a simple averaging would produce disagreements, the tariff rates were determined through negotiation; these products included agricultural, food, mining, metal and textile goods, which have tended to be the sectors in which protection has been the most concentrated. With the CCT in place, then, the responsibility for many key areas shifted from individual member states to the Community.[11] Countries that have joined the EC subsequently are required to adopt the CCT.

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[10] The four customs territories were France, Germany, Italy, and the Benelux (Belgium, Netherlands, and Luxembourg).

[11] Nevertheless, governments still retained some residual power, for whereas tariffs came under the control of the EC, customs regulations did not, so that states could still impose individual import quotas on non-member states (Hoeller et al, 1998).

Tariff rates for the EC are not readily available for the period of interest. As a result, they were obtained from various issues of the *Official Journal of the European Communities*, which publishes the common tariff schedule annually. In general, these duties enter into force on January 1st of the following year, but from 1971 to 1974, the schedule was published on January 1st, to take effect immediately.[12] Import duties are expressed in three ways: as *ad valorem* tariffs equal to a percentage of the product's value; as specific tariffs per unit weight, volume, or number of pieces; or as a combination of the two. In all cases, tariffs are based on the CIF value (cost, insurance, freight). Duties are expressed as conventional duties, meaning that they are applicable to imported goods originating in countries which are contracting parties to the GATT, or with which the EC has concluded agreements containing the most-favored nation tariff. Autonomous duties are also reported; these are applicable whenever conventional duties are higher or non-existent. For the purposes of this paper, conventional *ad valorem* duties are used. In the cases where the duties were expressed as a combination of *ad valorem* and specific tariffs, I used only the *ad valorem* part, whereas when the duties were expressed as specific tariffs, I treated it as missing data. This only affected some 15 out of the total sample of 100 industries, and I run regressions excluding those industries to make sure the results are not affected by the way the tariffs were constructed.

Data were collected for every other year, beginning with the 1969 issue. It was decided to start with the 1969 issue, rather than the 1968 issue (which marked the beginning of the Common Customs Tariff) because there was no tariff schedule published in 1970. Issues can be found in paper or in microfiche, and there was no English edition prior to the UK and Ireland's accession in 1973, so the French version

[12] In 1985, two tariff schedules were published. The first one, L330, had tariffs adjusted for Spain and Portugal, but were suspended for a period of two years pending completion of negotiations within GATT. Since in the meantime, tariffs published in L331 were used, this was the tariff schedule used for 1985.

was used for those years. They vary in size from around 350 pages before 1987 and nearly 1000 pages afterwards.

Tariff rates before 1987 are classified in the Brussels Tariff Nomenclature (BTN), which needed to be converted to the 3-digit level of the EC's Industrial Classification, called NACE (Nomenclature générale des activités économiques dans les Communautés Européenes), in order to match the industry variables. A concordance table between the 6-digit Nimexe (Nomenclature of Goods for the External Trade of the Community and Statistics of Trade between Member States) and the 3-digit NACE, from Jon Haveman's Industry Concordances web site, was used. Nimexe is closely related to the BTN, in that it corresponds exactly at the 4-digit level. In order to determine the 6-digit equivalent, the description of the Nimexe category was compared to the description of the BTN subdivisions until a match was made.

Some of the NACE categories corresponded to only one Nimexe, but in most cases, there were several Nimexe that made up one NACE industry. Rather than simply averaging all the corresponding tariff rates, which would have made it difficult to accurately reflect the size of changes in the level of protection, it was decided to add up the EC's exports to and imports from the rest of the world in 1976 for each Nimexe,[13] then find the percentage of trade each of those products represented within each NACE. All products that accounted for at least 10% of the trade in an industry were used in determining the tariff for that industry. For the industries where no product met that threshold, or for those where all the products meeting that threshold, taken together, did not account for at least 50% of the trade, all the products with the highest trade percentage and which, when added up, met the 50% threshold, were used. For many NACE industries, however, more than one product was used to represent the industry. In this case, the tariff rates were aggregated using the import share as weights.

[13] Exports and imports are measured as value, in 1000 ECU.

Tariff rates data for 1987 and 1989 were in the Combined Nomenclature (CN), which, again, needed to be converted to the 3-digit level of NACE. The correspondence table between the two classifications was taken from Eurostat's *Intra- and Extra-EU trade (Combined Nomenclature)*, Supplement 2. As before, some of the NACE categories corresponded to only one CN, but in most cases, there were several CN that made up one NACE industry, as in the case of NACE 221, which consisted of 505 CN categories. As a result, the same procedure outlined above was used, only this time the trade data used to determine which products accounted for at least 10% of the data (and to calculate the weights) were for 1988.

Industry

Industry data come from Eurostat's *Structure and Activity of Industry: Annual Inquiry, Main Results*. This publication began in 1976, in accordance with a 1972 Council directive requiring coordinated annual surveys of industrial activity,[14] and ended in the early 1990's, after a revision of the industry nomenclature. It covers all enterprises in industry employing 20 or more persons (with the exception of Spain and Portugal, which contain data for all enterprises) and whose principal economic activity, defined as the one in which the greatest value-added is created, or which employs the largest number of persons, falls in one the 3-digit headings of NACE. The data were collected for the publication year, rather than the year tariffs entered into force. This was done because the publication year more closely reflected the time when the decision was made.

Since the first available year for the industry data was 1976, it was decided to use that year's data for the 1969-75 period as well, under the assumption that these characteristics had not changed much over that period.[15]

Because the industry data contained missing data, I collected data for every year, rather than every other year. In cases where the previous and next year's data were

[14] Council Directive 72/221/EEC of June 6, 1972, published in Official Journal L133 of June 10, 1972.
[15] Magee and Lee (2001) refer to a 10-year period for industry adjustment.

available, I used them to interpolate the values. This was not always possible, since there were instances where only the previous year's or the next year's was available (but not both). In those cases, I simply used the data from the closest year to fill in what was missing. I also established a criterion to determine whether I should keep an industry or drop it for lack of data. As long as there were at least five out of the total possible 11 countries available,[16] and sufficient years for interpolation to be used and as long as there were both industry and trade data available, I kept the industry. In the end, out of 124 industries, 100 industries were used.

Data on firms employing less than 20 persons are available in 5-year intervals, though not for all country-industry pairs. In order to adjust the data to include small firms, I calculated, for each variable, the proportion represented by the small firms—for instance, in the case of production, I calculated the production share of small firms in total production for the three years available. These shares did not change much from one period to the next, so I averaged them and used them to calculate the values for all firms.

Trade

Data on exports and imports for the 1976-87 period come from Eurostat's *EEC External Trade (Nimexe) 1976-87,* Supplement 2. Again, 1976 data are used for the 1969-75 period. Data for 1989-89 come from Eurostat's *Intra- and Extra-EU trade (Combined Nomenclature)*, Supplement 2. The data were aggregated from the 6-digit Nimexe and from the 8-digit CN into the 3-digit NACE.

One problem with matching the trade data to the industry data is that the trade data refer to all firms, whereas, as mentioned above, the industry data are provided only for firms employing 20 or more persons. As indicated, I performed a correction to alleviate the problem and as a robustness check, I estimate the regressions without the trade-related variables and obtain the same qualitative results.

[16] I combine the industry data for Belgium and Luxembourg because the trade data are not provided for each country separately.

Predictions

This paper is not focused on explaining the observed structure of protection across industries, so the criterion for choosing the explanatory variables is less crucial. The variables chosen are the ones that have been used in previous empirical work and is mostly based on the list of key findings provided in Rodrik (1995). In particular, the literature predicts that protection is higher in an industry the:

• Larger the industry: the larger the industry seeking protection, the greater is the incentive to observe and perhaps join in the tariff-setting process. The size of the industry is measured as the share of employment in the industry.

• The smaller the number of firms: a smaller number of firms alleviates the free rider problem in coordinating a lobby, thus increasing the level of protection. Many studies, however, find a positive, rather than a negative, effect.[17] Hillman (1991) and Hillman et al. (2001) argue that lobbying can be regarded as a case of private provision of a public good, since when successful, it provides a public good-type benefit—increased protection—to all firms. A larger contribution by one firm does not necessarily decrease the contribution of other firms; as a result, increasing the number of firms in an industry can either increase or decrease the overall lobbying effort. Pecorino (1998) analyzes this issue in a repeated tariff lobbying game where cooperation may be maintained through the use of trigger strategies, so that the difficulty of maintaining cooperation is measured by the critical value of the discount parameter. He finds that the effect of an increase in the number of firms in the industry on the ability of maintaining cooperation is indeterminate.

• The lower the wage: disadvantaged industries often receive more protection. An industry is disadvantaged if it is a low-skill, and hence low-wage industry (Trefler 1993).

[17] See Potters and Sloof (1996) for a survey of empirical work.

• Higher its labor-intensity: the more labor-intensive an industry, the more labor votes it has. This is measured by the labor cost share.

• The lower the intra-industry trade: industries seeking protection will find their task harder if they must counter not only consumer dissatisfaction, but also producers who purchase their goods as intermediates (Marvel and Ray, 1987).

• The higher the import penetration: the higher the import penetration, the more will the affected industry lobby for protection, so as to decrease competition and maintain its market share (Trefler 1993). The theoretical literature, however, predicts an ambiguous relationship. In particular, the Grossman and Helpman (1994) political-economy model predicts that, if industries are organized protection should be higher in industries with low import penetration, and if they are not organized the relationship between protection and import penetration should be positive. Models predicting a negative relationship include Mayer (1984), Hillman (1982) and Findlay and Wellisz (1982). Another problem with this variable is its potential endogeneity, since a high tariff can lower import penetration. This will be dealt with in the fourth section.

• The greater the rise in import penetration: Declining sectors (those with large increases in import penetration) tend to receive more protection so as to reduce adjustment costs (Olarreaga et. al, 1999)

• The smaller the share of exports in production: export-oriented industries do not require protection either because they face no import competition or because, with intra-industry trade, protection will provoke unwanted foreign retaliation (Trefler 1993).

Finally, a dummy is included to control for the Tokyo trade round, which occurred more or less at the same time as the first enlargement.[18] This is predicted to have a negative relationship with tariffs, since each trade round resulted in multilateral

[18] The Tokyo Round began following the accession of the UK, Ireland and Denmark in 1973, and concluded in 1979.

tariff reductions. I us the trade round dummy rather than year fixed effects because it generates a clear prediction.

Empirical Strategy

Using the industry's characteristics described in the previous section for each country, the decisive country for each industry can be found for each type of decision rule, namely, the majority, the qualified majority, and the unanimity rule, as well as various logrolling options. In the first case, the decisive country is the median country; in the second, the decisive country is the one whose industry characteristics lie at about the 71st percentile in the industry distribution; in the third case, the country desiring the highest tariffs (i.e., the one lying at the highest end of the distribution) or the country desiring the lowest tariff will be the decisive one.[19] In the logrolling cases, the decisive country is the one whose characteristics lie at a percentile higher than the median, such as for instance the 60th percentile, or above the 71st percentile, such as the 80th percentile. In other words, the values for the variables actually used in the regressions are those lying at the relevant percentile, where the percentile used can be ascending or descending, depending on the sign prediction. To illustrate this, recall from the previous section that while the share of industry employment in the country, the labor cost share, the import penetration and the change in import penetration were all predicted to be positively related to the tariff rates, the number of firms, the wage rate, intra-industry trade, and the export intensity were anticipated to exhibit a negative relationship. For those with the positive relation, the percentile is, in this case, the 60th; but for those showing a negative relationship, the appropriate percentile is the 40th rather than the 60th.

The equation to be estimated is, then

$$t_{it} = \alpha + \beta C_{it}^{pct} + \delta T_t + \nu_i + \varepsilon_{it} \qquad (4)$$

[19] This is because either one will be most likely to veto a change in tariffs that goes against their preference.

where t_{it} denotes the tariff rate for industry i and time t; C_{it}^{pct} is the vector of the decisive-country's characteristics at percentile pct; T_t is a dummy indicating the conclusion of the Tokyo Round (equal to 1 for 1979-89 and 0 elsewhere); V_i is the industry-specific fixed effect, which is included to account for any time-invariant unobserved factors; and ε_i is the error term. Two forms of this equation are estimated. In one version, the independent variables are unweighted. As mentioned in the Introduction, the Article 113 Committee, on which each country has a seat (Greenway et al. 1993), supervises the European Commission as it negotiates trade treaties on behalf of the EC, serving as a forum in which member states iron out their differences over trade policy. If decisions are indeed made by the Committee, it would imply an unweighted specification. In the other version, the independent variables are weighted by the share of votes the country has in the Council of Ministers, so as to give greater weight to countries with a higher share of votes. The number of votes each country has is shown in Table 2-3. For comparison purposes, the same equation is also estimated using the mean of the industry characteristics. This specification is included to test whether it performs better than the decisive-country framework. Summary statistics are reported in Table 2-4.

Empirical work on the political-economy of protection generally makes an assumption regarding the functional form of the estimated regression equation. Theory, however, provides no guidance as to what form it should take, so the most sensible approach would be to test various functional forms against each other and make a selection on that basis. With this in mind, I performed J and P_E tests[20] to determine whether a linear, a logarithmic, or a model where the dependent variable is linear but the independent variables are in logs (lin-log) is the most appropriate functional form. The results are presented in Appendix Tables A-2 and A-3. In both cases, the lin-log specification is the preferred one, as it rejects the linear form in all models and the log in

[20] The P_E test is an extended version of the J-test used to test a linear model versus a log-linear model. See Davidson and MacKinnon (1981) and MacKinnon et al. (1983).

all but one of the models, while neither of those are able to reject it in more than three out of the seven models.

Results

Preliminary results are reported in Tables 2-5 and 2-6 for the seven voting models and two specifications. In Table 2-5 the independent variables are unweighted; while in Table 2-6, the variables are weighted by the share of votes each country has at a particular time in the Council of Ministers. All regressions include a full set of industry-specific fixed effects.

In both cases, the highest percentile rule seems to fit best, as indicated by the within R-squared, indicating that decisions have been made according to the unanimity rule of the Luxembourg Compromise, or that some form of logrolling occurred. In the discussion that follows, the emphasis is placed on the highest percentile model only.

The share of industry employment in the country does not have the predicted sign in either case, though it is significant. This could be due to a correlation with the number of firms, since both variables capture the size of the industry. The correlation between the two variables, however, is 0.2452, and estimating the equation without the number of firms does not alter the sign or the significance on the share of employment.

Theory suggests that the sign on the number of firms is ambiguous. Here, the variable is highly significant and positively related to the tariff rate.

The coefficients on wage, labor cost share, the intra-industry index, and the import penetration are all insignificant, though the change in import penetration is highly significant and exhibits a negative, rather than the predicted positive sign.

Surprisingly, the share of exports in production does not have the predicted sign, though it is highly significant. Industries that devote a large share of their production toward exports would not benefit from a tariff increase, and in fact might even be harmed by it, as protection might bring foreign retaliation. The results, however, indicate that tariffs are higher in these industries.

Finally, the prediction that the Tokyo Round decreased tariffs is supported by the results. The coefficient is also highly significant, which is to be expected, since most tariff decreases have been due to the various trade rounds of negotiation.

These results then suggest that decisions have been made according to the unanimity rule, or that if they were, that some form of logrolling occurred. There is also an indication that changes in the European common tariff are best explained by the share of employment, the number of firms, the change in import penetration, the export share, and the Tokyo Round. Because at the highest percentile the proportion of votes does not matter, it is impossible to conclude which specification is the best.

Sensitivity Analysis

J-tests

Comparing models on the basis of their R-squareds is not the only way of deciding which one best explains the variable of interest. Because the estimated equations are OLS regressions with fixed effects, the R-squared is an appropriate measure of fit. To test the robustness of the results, then, I perform J-tests of the highest percentile specification against the lowest, the mean, and the median. The J-test can be used to see if the model that had highest R-squared does in fact have a greater explanatory power than the alternatives, but it has the disadvantage that oftentimes it is impossible to make a selection between models. The results, shown in Table 2-7, indicate that this is indeed the case. The highest percentile model rejects all specifications, but those specifications in turn also reject it. The t-statistic when the highest percentile is the alternative hypothesis is always higher than when it is the Null, which gives some suggestion that the highest percentile model performs better in explaining tariff rates.

Endogeneity of import penetration

Some of the variables used as indicators of political influence present a potential endogeneity problem. For instance, the higher the tariffs, the less will domestic consumers buy of imported goods, resulting in a decrease in imports altogether. It would

be desirable to consider the joint determination of import penetration levels with tariff protection and perform a simultaneous estimation of the two equations, as in Trefler (1993). Due to data restrictions, however, such an approach is not possible.[21] The first column in Tables 2-8 and 2-9, though, present the R-squareds resulting from running the same regressions as before, only this time without the import penetration and the change in import penetration variables. What is found is that the results are unchanged in both specifications, in that the model that fits best is still the highest percentile specification. The results, then, do seem to indicate that the endogeneity of import penetration had no impact on the conclusions drawn.

Tariff weighting

Now, one problem that has been pointed out repeatedly in the literature concerns the use of import shares as weights when aggregating tariffs to the industry level. This can potentially cause a low weight to be attached to products that face high tariffs, since those goods are likely to have low imports for reasons stated above. Lee and Swagel (1995) construct average tariffs using import shares and production shares as weights. Production shares tend to overstate protection, much the same way that import shares understate them. Their results indicate that the correlation between the two measures is very high, in the order of 0.98.

Since I do not have detailed enough data to construct production share weights, I experimented with using the simple average of the tariff rates and re-ran the regressions to determine whether the choice of weights had any impact on the results. As indicated in the second column of Tables 2-8 and 2-9, the highest percentile logrolling model still fits best in both specifications. These results then suggest that the results are robust to the choice of a weighting scheme.

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[21] Trefler estimates a simultaneous equations Tobit model, with one equation with non-tariff barriers and another with import penetration as the dependent variable. The explanatory variables used in the import penetration equation are measures of factor endowments, which are not available for the EC at a detailed enough level and for the period in question.

***Ad valorem* vs. specific tariffs**

Another possible problem is the fact that I treated specific tariffs as missing and, in the cases where it was a combination of *ad valorem* and specific tariffs, I only considered the *ad valorem* portion. To investigate whether this had any impact on the results, I excluded all the industries that contained products with specific tariffs or a combination of the two. The results, shown in the third column of Tables 2-8 and 2-9, demonstrate that this method of constructing the tariff rates had no impact, as the highest percentile model still has the highest R-squared.

Sample period

Since the industry and trade data for 1977 were used to represent the characteristics for the 1969-75, it is possible that these results might be subject to measurement error. To investigate this, the same regressions were ran, only now restricting the sample to 1977-89. The results are shown in the fourth column of Tables 2-8 and 2-9. In the unweighted case, the highest percentile still performs slightly better than the other specifications, though in the weighted case, it is the 80^{th} percentile that performs best. This gives some indication that weighting provides a better fit.

Trade vs. industry

Another possible source of error stems from the fact that the industry data referred to firms employing 20 or more persons, whereas the trade data contained all firms. A correction was performed to mitigate the bias, but to further check whether it was driving the results, I performed the same regressions, this time excluding all the trade-related variables. As shown in the fifth column of Tables 2-8 and 2-9, the results are unchanged.

Functional form

As discussed previously, I performed J- and P_E-specification tests to determine the appropriate functional form for the analysis. To ensure that the choice of functional form has no impact on the results, I experimented with using a linear specification (shown in the sixth column of Tables 2-8 and 2-9) and with a log specification (column

7). The results indicate that choice of functional form does not alter the results, as the highest percentile still had the highest R-squared in both cases.

Time fixed effects

A possible concern that might arise regards the use of a Tokyo Round dummy instead of time fixed-effects. To investigate whether this choice affected the results obtained, I re-ran all regressions, only this time including time dummies in place of the Tokyo Round dummy. As shown in the next-to-last column of Tables 2-8 and 2-9, the highest percentile specification still performed slightly better than any of the other specifications.

Change in classification

In 1987, the EC changed its trade and tariff classification to the Combined Nomenclature, which is much more detailed than the previous classification.[22] As detailed previously, rather than using the same products in constructing the tariff rates for each industry that were used for the pre-1987 period, I chose the products that had the highest share of trade in 1988. This was necessary because one BTN category might split into several CN categories, which would have made it harder to gauge tariff changes post-1987. To investigate whether this method altered the results, I re-estimated each model restricting the sample period to 1985. As indicated in the last column of Tables 2-8 and 2-9, the conclusions drawn are insensitive to the change in classification.

Finding the Decisive Country

If one were to count the number of times that a country's industry characteristics matched the appropriate percentile in the distribution and do it for every industry characteristic, one will most likely be unable to find a decisive country. Imagine, for example, a situation where France was the decisive country (at, for instance, the 80^{th} percentile) in the number of firms and the share of employment, Germany was decisive in

[22] Before 1987, the Official Journal issues containing the tariff schedule contained around 350 pages. After 1987, the number of pages jumped to nearly one thousand.

labor cost share and import penetration, Belgium was decisive in the change in import penetration and export intensity, and Italy was decisive in the wage rate and intra-industry trade. This, then, results in an inconsistent result, in that there are now four potential decisive countries.

To address this issue, two methods were developed. The first one identifies which industry characteristic had the greatest explanatory power and then uses it to find the decisive country. This is done by ranking each country on the basis of the most influential variable, so that the decisive country becomes the one whose variable lies at the relevant percentile. The second one uses a regression explaining 1958 tariffs for each country to predict that country's preferred tariff rate. Here the decisive country is selected by ranking them on the basis of their preferred tariff rates, then picking the one whose preferred tariff lies at the appropriate percentile. Once the decisive country is determined, I ran the same regressions as before, only this time choosing the decisive country based on one of these two criteria. I then examined how the decisive country changed in the iron and steel industry (NACE 221) and the knitting industry (NACE 436), as well as on average.

Bivariate Method

The first method used to circumvent the problem of inconsistent decisive countries was the Bivariate Method. Here I regress the tariff rates against each of the industry characteristics, along with a set of industry fixed effects, to determine which of the industry characteristics were the most influential in affecting tariffs and use it to order the countries.

The results are shown in Tables 2-10 and 2-11. In Table 2-10, the labor cost share has the greatest explanatory power for all models, with the exception of the 80^{th} percentile and the highest unanimity rule, in which case the number of firms performed best. In Table 2-11, the labor cost share has the highest R-squared for all but the 60^{th} and highest percentile, in which case it was the import penetration and the number of firms

that performed best, respectively. All of these variables had the predicted sign. For the purposes of this exercise, then, the variable providing the best fit for each model is used to determine the decisive country. In other words, in the case of the median specification, the country whose labor cost share lies at the median is the decisive country, regardless of whether any of its other industry characteristics also lies at the median. Using the data for the country that was decisive for each industry-year pair, I then re-estimated the voting models. The results, presented in Tables 2-12 and 2-13, show that the highest percentile model still performs best, though only slightly. The number of firms and the Tokyo Round dummy are still highly significant and the labor cost share is now significant and has the correct sign.

Preferred Tariff Method

An alternative method to finding the decisive country involves using each country's tariff rates from before a common tariff was established—in this case, from 1958—to predict what their tariffs would have been had they not joined the EC; in other words, their preferred tariff rates are determined.

Tariffs for 1958 were taken from *Tariffs and Trade in Western Europe,* a report prepared by the Political and Economic Planning (PEP) organization in 1959 whose purpose was to present basic information needed to examine the EC's integration process. The data is presented for 8 EC countries—Denmark, the UK, Germany, Belgium, Luxembourg, Netherlands, France and Italy, as well as Austria and Sweden, which became members in 1995. As in the case of the 1969-89 period, the tariffs needed to be converted from the BTN into the 3-digit NACE and a similar procedure as before was used. The sample includes data for 100 industries and 5 countries (France, Germany, Italy, Netherlands and Belux, or Belgium and Luxembourg combined).

The first step is to estimate the relationship between the 1958 tariffs for each country and sector, and the industry characteristics. Since comparable industry data are not available for 1958, 1976 data are used instead. Here it is assumed that the function

determining each country's preferred tariff does not change, so using 1976 data should not have an impact. Results are shown in Table 2-14. The share of employment, the number of firms and the change in import penetration are significant, with the share of employment still exhibiting a negative, rather than the expected positive sign.

The second step is to use these estimates to predict each country's preferred tariff rate based on the 1969-89 industry data. With these results, I can then order countries on the basis of their tariff preference, from the country having the lowest preferred tariff to the country with the highest preferred tariff. Once I determine the preference ordering, I can then find the decisive country for each voting rule, so that, for instance, if the voting rule is simple majority, the decisive country is the one whose preferred tariff rate lies at the median. The last step is then to use the data for the decisive country, as determined through their policy preferences, to re-estimate the voting models. The results are shown in Tables 2-15 and 2-16 and once again, they indicate that the highest percentile model performs the best, with a slightly better fit than in the bivariate method. The share of employment is now positive, but insignificant, as is the number of firms, while the wage is now positive and highly significant. This could be due to a correlation with the labor cost share; however, the correlation between the two variables is only 0.003, and deleting one of the variables does not change the sign or significance of the other. The change in import penetration and the Tokyo Round dummy still exhibit a negative sign and are significant. These results then provide strong evidence that decisions during the 1969-89 period were made at the highest percentile.

Changes in the Decisive Country

The final exercise consists of examining how the distribution of countries has shifted over time for the original set of member countries and where the new countries came into the distribution, so as to determine whether changes in the decisive country were due to shifts in the distribution or to the enlargements. To do this, I focus on two

industries, NACE 221 (iron and steel) and NACE 436 (knitting industry), which is the industry that had the highest share of production among all the textile industries.

These industries were chosen because they are the ones where lobbying has been the most pronounced. The steel industry is highly concentrated, with the seven largest EC companies accounting for over 50% of total steel production. The six largest EC producers are Germany, Italy, France, the UK, Spain and Belgium, and together they account for 84% of EC production. And as a result of concentration, as well as strong unions and labor intensity, the steel lobby is very strong (Verreydt 1982).

As for the textile and clothing sector,[23] lobbying for protection plays a large role in the industry's strategy, so much so that it has become a very powerful lobby, seeking to curb competition from low wage countries, which it feels can destroy the industry in the EC. Indeed, lobbying was decisive in the renewal of the Multi-Fiber Agreement in 1977, where, due to France's introduction of quotas on textiles and clothing in violation of the Community's rules, as well as indications that other members might follow suit, the EC increased barriers to imports (Hine 1985). The industry represents about 10% of companies in the EC and employs over 2.3 million people. The EC is the world's second largest exporter of textiles and clothing products and the largest exporter of textiles (DG Trade 2001).

Figures 2-4 and 2-5 show the evolution of the import-weighted tariff rate for the two industries from 1969-89. Figure 2-4 indicates that NACE 221 experienced a sharp decline in its tariff between 1979 and 1985, a period that included the accession of Greece, but that it increased again when Spain and Portugal joined the EC. As for the knitting industry, Figure 2-5 shows that the tariff rate for NACE 436 also experienced

[23] This sector has the heaviest concentration of employment in Lombardy (Italy), Catalunya (Spain), Bavaria and Nordrhein-Westfalen (Germany), Norte (Portugal), Wallonie (Belgium), and Région du Nord (France) (WTO 1998).

substantial decline between 1979 and 1985, going from about 17.5 to 13.5% in 1985, with increases again seen precisely at the time when Spain and Portugal joined the EC.

Since the preferred tariff method (Tables 2-15 and 2-16) provided a better fit than the bivariate method (Tables 2-12 and 2-13), the results presented in Tables 2-17 and 2-18 ranks countries on the basis of their preferred tariff rates in the iron and steel and the knitting industry, respectively. I also focus only on the years before and after each enlargement, so as to illustrate its impact on the decisive country.

According to Table 2-17, the first enlargement in 1973 caused a shift in the decisive country in the iron and steel industry in favor of a new member, the UK. This shift was due to the UK coming in with a higher preferred tariff than Italy and moving the other countries down in the distribution. Had there been no enlargement, Italy would have still been the decisive country. By 1979, or six years later, there was a shift in the distribution, in that France now had a higher preferred tariff than Italy, though the UK was still decisive. There were no new shifts in the distribution after the second enlargement in 1981, and since Greece entered between Germany and Denmark, it had no impact. Four years later, in 1985, Italy and France switched places in the distribution, but the UK still remained decisive. Following the 1986 enlargement, Spain entered the distribution above France, while Portugal entered between Germany and Greece, so that the UK remained the decisive country.

As for the knitting industry, Table 2-18 shows that the first enlargement in 1973 had no impact on the decisive country, as the new members came in at the lower end of the distribution, causing Germany to remain decisive. In 1979, the UK and Belgium and Luxembourg switched places in the distribution, but that had no impact on the decisive country. France becomes decisive after the second enlargement in 1981, as Greece enters between Italy and the UK and France's preferred tariff rate becomes higher than that of Germany. Had Greece not joined the EC, France would have still been the decisive country. In 1985, Belgium and Luxembourg's preferred tariff rate places it below the

Netherlands, but France remains the decisive country. Following the third enlargement in 1986, there is a change in the decisive country, as Spain enters atop the distribution to become decisive. Had Spain and Portugal not joined the EC, France would have remained the decisive country. In the case of both industries, then, instances are found of the political equilibrium shifting in favor of a new member.

In Table 2-19, I again rank countries on the basis of their preferred tariff rates, only this time I examine it in the aggregate so that I can draw conclusions as to how the decisive country has changed over time. This was done by averaging the preferred tariff rates for each country across industries. Here it is seen that there is no change in the decisive country until the third enlargement occurs, in which case Spain replaces Germany atop the distribution. Had there been no enlargement, however, France instead of Germany would have been the decisive country, as they traded places in the distribution. In all other years, there is no shift in the distribution and the new members' entrance had no impact.

These results then indicate that shifts in the pivotal country have been due to either shifts in the location of existing countries in the distribution, or to the entry of new countries at the top of the distribution. Furthermore, as pointed out before, one effect of the increase in the number of EC member countries has been to alter the relative power of each country in the Council of Ministers. Because the number of votes is based on population, large countries have more votes than small countries, but given how small countries increasingly outnumber large countries, it is quite possible for the political equilibrium to shift in favor of smaller countries, thus diminishing the influence of large countries. The results suggest, however, that despite the enlargements, large countries have still managed to remain decisive, so that their preferences are the ones that determine the EC tariff rates.

Conclusion

This paper developed a novel test of different political-economy models to determine which one best describes tariff-determination in the European Community. In particular, it used existing political-economy models to present a framework for examining how tariffs are set in the European Community, using the political support function approach to formulate an empirical test. This procedure consisted of regressing the political-economy variables of the decisive country under each specification against the tariff rate. These specifications included the median (to reflect majority voting); the 71st percentile (to reflect the qualified majority voting rule used in the EC); the lowest and the highest point in the distribution (to reflect unanimity); and the 60th and 80th percentiles, to reflect possible logrolling outcomes. The decisive country was the one whose industry characteristics lay at the relevant percentile. Equations using the mean characteristics were also estimated. Two specifications were used: unweighted independent variables and weighted by the share of votes a country has in the Council of Ministers.

Empirical results suggested that decisions have been made around the highest percentile, possibly indicating that countries either used their veto power allowed under the Luxembourg Compromise, or traded votes. The data also implied that changes in the European common tariff during the 1969-89 period were best explained by the share of employment, the number of firms, the change in import penetration, the export share, and the Tokyo Round. These results were robust to eliminating potentially endogenous variables, to using simple averages rather than import-weighted tariffs, restricting the sample period, excluding industries that included specific tariffs in addition to *ad valorem* tariffs, excluding all the trade variables, changing the functional form and including time fixed-effects instead of a Tokyo Round dummy. The results were also robust to using different methods to find the decisive country. The first approach, which I dubbed the "bivariate method," consisted of determining which variable had the most

explanatory variable by regressing tariffs against each of the industry characteristics. The decisive country was then the one whose most important industry characteristic lay at the relevant percentile. For the second method, the "preferred tariff method," I used a regression explaining pre-EC country-specific tariff rates to predict each country's preferred tariff rate, or the tariff the country would levy if it were not part of the customs union, based on the 1969-89 industry data. I then used these predictions to order each country based on their policy preferences, so that the decisive country became the one whose preferred tariff rate lay at the appropriate percentile. In both cases, I found the decisive country for each industry-year and each voting rule, and then re-estimated the models. Again, the highest percentile model best explained the observed tariff rates. These results strongly suggest that decisions were indeed made under the unanimity requirement that resulted from the Luxembourg Compromise, or that countries traded their votes on one issue in exchange for votes on another issue, so that the common tariff ended up being higher than it would have been had no vote trading occurred. The results also provide strong support for the decisive-country framework used to describe how decisions were made in the EC for the 1969-89 period. Throughout the analysis, a specification where each country's characteristics is averaged for each year and industry was also estimated as a test of the decisive-country model, but it did not have a better explanatory power than the highest percentile model. This finding is reversed, however, if one examines the period after the 1987 Single European Act, which has been characterized by increased integration, so that more and more the EC is behaving like a single country, rather than as a collection of countries, as the decisive country framework suggests.

The paper also attempted to find how the decisive country changed over time, to determine whether those changes were due to shifts in the distribution or to the enlargements themselves. I ranked countries by their preferred tariff rates, since the preferred tariff method provided the best fit—and focused on the highest percentile

voting rule. First I examined two industries where lobbying is prevalent, iron and steel and the knitting industry. Then, I performed the analysis after averaging all preferred tariffs across industries. The results provide evidence of shifts in the political equilibrium due to shifts in the location of existing member countries in the distribution and to the entry of new countries at the top of the distribution. The results also suggest that despite the enlargements, large countries have still remained decisive, so that their preferences are the ones that determine the EC tariff rates.

The methods developed in this paper also enables one to determine whether the common tariff is higher or lower than the tariffs each country would have levied if it were not part of the customs union. Krugman (1991) argues that the larger the customs union, the greater is their market power, and hence the higher their tariff. In Figure 2-6, I plot the average common tariff along with each country's average preferred tariff rate, as predicted in one of the methods described above, over the 1969-89 period. According to the figure, having a customs union did indeed result in the EC levying higher tariffs than it would otherwise have had, as every countries' preferred tariff rate have been lower than the common tariff. This then supports the view that the EC has been exercising greater market power with each enlargement.

Table 2-1—Illustrating Logrolling

	Issues	
Country	Increase steel tariff	Increase textile tariff
UK	5	-1
Portugal	-1	5
Denmark	-1	-1

Table 2-2—Variable Sources and Definitions

	Definition	Source	Years
Tariff (%)	individual ad valorem tariffs	*Tariffs and Trade in Western Europe*	1958
	common customs tariff ad valorem	*Official Journal of the European Communities,* various years	1969-89
Share of employment	employment in sector *i* divided by the total number of employees in the country	*Structure and Activity of Industry:* Annual Inquiry, Main Results.	1976-89
# Firms	number of enterprises	*Structure and Activity of Industry:* Annual Inquiry, Main Results.	1976-89
Wage	wages divided by employment, in 1989 ECU	*Structure and Activity of Industry:* Annual Inquiry, Main Results.	1976-89
Labor cost share	labor costs divided by the value of production	*Structure and Activity of Industry:* Annual Inquiry, Main Results.	1976-89
Intra-industry trade	Grubel-Lloyd index of intra-industry trade, defined as one minus (absolute value of exports minus imports divided by exports plus imports)	Eurostat's EEC External Trade (Nimexe) 1976-87 Supplement 2; Intra- and Extra-EU trade, Supplement 2	1976-89
Import penetration (%)	value of imports divided by apparent consumption (production value plus value of imports minus value of exports), times 100	Eurostat's EEC External Trade (Nimexe) 1976-87 Supplement 2; Intra- and Extra-EU trade, Supplement 2	1976-89
Δ Import penetration (%)	import penetration in year *t* minus import penetration in year *t-1*	Eurostat's EEC External Trade (Nimexe) 1976-87 Supplement 2; Intra- and Extra-EU trade, Supplement 2	1976-89
Export share	value of exports divided by the value of production	Eurostat's EEC External Trade (Nimexe) 1976-87 Supplement 2; Intra- and Extra-EU trade, Supplement 2	1976-89

Table 2-3—Distribution of Votes in Council of Ministers

Country	Number of Votes (EC-6)	Number of Votes (EC-9, EC-10, EC-12)
Belgium, Netherlands	2	5
Denmark, Ireland		3
France, Germany, Italy	4	10
Greece, Portugal		5
Luxembourg	1	2
Spain		8
UK		10

Source: European Communities (1999).
Note: EC-6 refers to the EC before the first enlargement in 1973. EC-9 refers to the EC following the first enlargement, EC-10 denotes the EC after the second enlargement in 1981, and EC-12 indicates the EC following the third enlargement in 1986.

Table 2-4—Summary Statistics

	Mean	Std Dev	Min	Median	60^{th} Pctile	70^{th} Pctile	80^{th} Pctile	Max	# of Obs.
Tariff (%)	9.08	10.93	0	7.206	8.583	9.823	11.63	91.53	9100
Employment share (%)	1.29	1.47	0.01	0.70	1.02	1.37	1.99	12.98	7040
# Firms	322.30	768.8	2	113	171	262	414	23194	7040
Wage (1000 ECU/worker)	16.29	5.2	1.64	15.79	17.07	18.50	20.48	38.51	7040
Labor Cost Share (%)	27.00	11.07	1.78	27.04	29.87	32.29	35.49	95.75	7040
Intra-industry Trade (%)	52.73	28.30	0	53.78	63.32	71.44	81.55	100	7040
Import Penetration (%)	19.11	21.56	0	10.54	15.76	22.97	33.37	99.89	7040
Δ Import Penetration (%)	0.30	6.74	-84.87	0	0.21	0.82	1.99	84.12	7040
Export Share (%)	18.99	18.82	0	13.19	17.73	23.21	30.81	99.31	7040

Sources: See Table 2-2.
Note: The share of employment, labor intensity, intra-industry trade index, and the export share are scaled to percentage terms. ECU refers to the European Currency Unit, which, on average, is equal to $ 0.938.

Table 2-5—Unweighted Regressions Testing Voting Models

Independent Variables are Unweighted Dependent Variable: Import-Weighted Common Tariff							
	Lowest	Mean	Median	60th Pctile	QMV	80th Pctile	Highest
Employment share	0.551	-1.740	-0.720	-0.603	-0.647	-0.282	-1.136
	(0.137)**	(0.431)**	(0.259)**	(0.256)**	(0.235)**	(0.284)	(0.230)**
# Firms	-0.115	0.257	0.396	0.224	0.526	0.372	0.333
	(0.194)	(0.275)	(0.119)**	(0.127)*	(0.142)**	(0.143)**	(0.129)**
Wage	-1.273	0.045	0.209	0.892	0.756	0.891	0.360
	(0.415)**	(0.511)	(0.432)	(0.427)*	(0.463)	(0.365)**	(0.226)
Labor cost share	0.648	2.114	1.687	2.009	2.247	1.635	0.521
	(0.220)**	(0.614)**	(0.594)**	(0.725)**	(0.691)**	(0.619)**	(0.405)
Intra-industry	-1.235	-1.060	-0.649	-1.153	-1.519	-1.046	0.362
	(0.736)*	(0.988)	(0.874)	(0.883)	(0.770)*	(0.673)	(0.585)
Import penetration	0.161	-1.318	-0.810	-0.408	-0.317	-0.309	-0.317
	(0.170)	(0.373)**	(0.357)*	(0.368)	(0.382)	(0.315)	(0.208)
Δ Imp. penetration	-0.002	0.014	0.061	0.054	0.036	0.013	-0.010
	(0.007)	(0.015)	(0.020)**	(0.022)**	(0.016)*	(0.006)*	(0.004)**
Export share	-0.415	3.336	2.050	-0.020	0.210	0.100	3.295
	(0.683)	(1.535)*	(1.419)	(1.418)	(1.265)	(1.398)	(1.310)**
Tokyo round	-1.459	-1.295	-1.469	-1.600	-1.451	-1.523	-1.142
	(0.119)**	(0.162)**	(0.142)**	(0.161)**	(0.152)**	(0.130)**	(0.108)**
Obs	1100	1100	1100	1100	1100	1100	1100
R-squared (within)	0.2858	0.2927	0.2822	0.2732	0.2861	0.2786	0.3236
F-statistic	44.06	45.56	43.29	41.40	44.13	42.52	52.69

Sources: See Table 2-2.

Note: Panel regressions were run for 100 industries over 11 years (every other year from 1969-1989). Heteroskedasticity-consistent standard errors are in parenthesis. Estimates marked ** are significant at the 1-percent level; those marked * are significant at the 5-percent level. All independent variables are in logs, except for change in Import penetration and the Tokyo round dummy (equal to 1 starting in 1979). The estimated equations also include a full set of industry dummies, which are not included in the calculation of the R-squared and the F-statistic, as well as a constant. Each column consists of one regression, with the headings indicating the voting model. Lowest and highest refer to the models testing unanimity; median tests the median-voter model; QMV tests the qualified-majority voting requirement (equivalent to the 71st percentile); and the 60th and 80th percentiles refer to the logrolling models. The mean regression is included for reference.

Table 2-6—Weighted Regressions Testing Voting Models

Independent Variables are Weighted by Votes in Council of Ministers
Dependent Variable: Import-Weighted Common Tariff

	Lowest	Mean	Median	60th Pctile	QMV	80th Pctile	Highest
Employment share	0.551	-1.709	-0.218	-0.466	-1.139	-0.352	-1.136
	(0.137)**	(0.501)**	(0.302)	(0.251)*	(0.312)**	(0.221)	(0.230)**
# Firms	-0.115	0.082	-0.065	-0.585	0.128	0.072	0.333
	(0.194)	(0.299)	(0.265)	(0.212)**	(0.144)	(0.131)	(0.129)**
Wage	-1.273	0.124	0.655	0.965	0.733	1.535	0.360
	(0.415)**	(0.590)	(0.422)	(0.444)*	(0.508)	(0.425)**	(0.226)
Labor cost share	0.648	1.943	1.721	0.854	2.249	2.117	0.521
	(0.220)**	(0.645)**	(0.571)**	(0.594)	(0.778)**	(0.630)**	(0.405)
Intra-industry	-1.235	-0.969	-0.141	0.067	-1.216	-0.143	0.362
	(0.736)*	(1.113)	(1.076)	(0.833)	(0.831)	(0.838)	(0.585)
Import penetration	0.161	-1.388	-0.773	-0.921	-0.262	-0.728	-0.317
	(0.170)	(0.490)**	(0.414)*	(0.415)*	(0.426)	(0.362)*	(0.208)
Δ Imp. Penetration	-0.002	0.012	0.033	0.028	0.030	0.008	-0.010
	(0.007)	(0.015)	(0.019)*	(0.015)*	(0.015)*	(0.006)	(0.004)**
Export share	-0.415	3.884	4.154	3.133	-0.554	0.945	3.295
	(0.683)	(1.737)*	(1.468)**	(1.340)**	(1.328)	(1.297)	(1.310)**
Tokyo round	-1.459	-1.349	-1.621	-1.711	-1.673	-1.614	-1.142
	(0.119)**	(0.171)**	(0.149)**	(0.145)**	(0.157)**	(0.154)**	(0.108)**
Obs	1100	1100	1100	1100	1100	1100	1100
R-squared (within)	0.2858	0.2857	0.2721	0.2747	0.2746	0.2891	0.3236
F-statistic	44.06	44.04	41.16	41.69	41.68	44.77	52.69

Sources: See Table 2-2.

Note: Panel regressions were run for 100 industries over 11 years (every other year from 1969-1989). Heteroskedasticity-consistent standard errors are in parenthesis. Estimates marked ** are significant at the 1-percent level; those marked * are significant at the 5-percent level. All independent variables are in logs, except for change in Import penetration and the Tokyo round dummy (equal to 1 starting in 1979). The estimated equations also include a full set of industry dummies, which are not included in the calculation of the R-squared and the F-statistic, as well as a constant. Each column consists of one regression, with the headings indicating the voting model. Lowest and highest refer to the models testing unanimity; median tests the median-voter model; QMV tests the qualified-majority voting requirement (equivalent to the 71st percentile); and the 60th and 80th percentiles refer to the logrolling models. The mean regression is included for reference.

Table 2-7—J-Tests

Variables are Unweighted			
Null	Alternative	t-stat	Conclusion
Mean	Highest	4.681***	Reject
Highest	Mean	3.159***	Reject
Median	Highest	6.568***	Reject
Highest	Median	3.911***	Reject
Lowest	Highest	6.443***	Reject
Highest	Lowest	2.344**	Reject

Variables are Weighted by Votes in Council of Ministers			
Null	Alternative	t-stat	Conclusion
Mean	Highest	5.723***	Reject
Highest	Mean	2.282**	Reject
Median	Highest	7.396***	Reject
Highest	Median	2.795***	Reject
Lowest	Highest	6.443***	Reject
Highest	Lowest	2.344**	Reject

Note: * denotes significance at the 10 percent level, ** at the 5 percent level and *** at the 1 percent level. Highest refer to the model testing unanimity; median tests the median-voter model; and the mean regression is included for reference.

Table 2-8—Sensitivity Analysis, Unweighted Specification

	Import Pen.	Tariff weight	Levies	77-89	No Trade	Linear	Log	Time FE's	69-85
Lowest	0.285	0.3137	0.3458	0.1517	0.2827	0.2772	0.2429	0.3718	0.3263
Means	0.2711	0.3159	0.3452	0.1547	0.2696	0.2857	0.2367	0.3825	0.3415
Median	0.271	0.2847	0.3298	0.1533	0.2686	0.2813	0.2176	0.3789	0.3156
60th Pctile	0.2681	0.2695	0.3198	0.1464	0.2661	0.2703	0.2193	0.3712	0.2997
QMV	0.2822	0.2763	0.3328	0.1453	0.2793	0.2721	0.229	0.3729	0.3214
80th Pctile	0.2753	0.2898	0.3259	0.1453	0.2740	0.2676	0.2337	0.3723	0.3189
Highest	0.3175	0.3509	0.3743	0.158	0.3146	0.3149	0.2558	0.3856	0.3692
Obs.	1100	1100	947	700	1100	1100	1100	1100	900

Note: Columns refer to different sensitivity tests, while each row corresponds to a voting model. Each cell refers to the within R-squared for a particular model and specification. The sensitivity tests are as follows: *import pen.* refers to a specification without the Import penetration and the change in Import penetration, which are potentially endogenous; *tariff weight* refers to employing the simple average, rather than the import-weighted common tariff; *levies* denotes that industries that contained specific tariffs in addition to ad valorem tariffs were deleted; *77-89* indicates that the sample was constrained to the 1977-89 period; *no trade* refers to a specification without any of the trade-related variables (intra-industry index, Import penetration, change in Import penetration, and the Export share); *linear* and *log* denote a specification in which none of the variables are in logs and one in which all variables are in logs, respectively; *time FE's* indicates that time fixed effects were included instead of a Tokyo round dummy; and *69-85* indicates that the sample was constrained to the 1969-85 period.

Table 2-9—Sensitivity Analysis, Weighted Specification

	Import Pen.	Tariff weight	Levies	77-89	No Trade	Linear	Log	Time FE's	69-85
Lowest	0.285	0.3137	0.3458	0.1517	0.2827	0.2772	0.2429	0.3718	0.3263
Means	0.2675	0.3135	0.3305	0.1570	0.2663	0.2815	0.2341	0.3822	0.3194
Median	0.2645	0.2852	0.3152	0.1566	0.2603	0.2732	0.2093	0.3750	0.2902
60th Pctile	0.2639	0.2817	0.3296	0.1444	0.2624	0.2779	0.2129	0.3815	0.3002
QMV	0.272	0.2561	0.319	0.1535	0.2702	0.2722	0.2235	0.3756	0.3012
80th Pctile	0.2785	0.2757	0.3402	0.1698	0.2783	0.2764	0.2433	0.3792	0.2945
Highest	0.3175	0.3509	0.3743	0.1580	0.3146	0.3149	0.2558	0.3856	0.3692
Obs.	1100	1100	947	700	1100	1100	1100	1100	900

Note: Columns refer to different sensitivity tests, while each row corresponds to a voting model. Each cell refers to the within R-squared for a particular model and specification. The sensitivity tests are as follows: *import pen.* refers to a specification without the Import penetration and the change in Import penetration, which are potentially endogenous; *tariff weight* refers to employing the simple average, rather than the import-weighted common tariff; *levies* denotes that industries that contained specific tariffs in addition to ad valorem tariffs were deleted; *77-89* indicates that the sample was constrained to the 1977-89 period; *no trade* refers to a specification without any of the trade-related variables (intra-industry index, Import penetration, change in Import penetration, and the Export share); *linear* and *log* denote a specification in which none of the variables are in logs and one in which all variables are in logs, respectively; *time FE's* indicates that time fixed effects were included instead of a Tokyo round dummy; and *69-85* indicates that the sample was constrained to the 1969-85 period.

Table 2-10—Unweighted Bivariate Regressions Identifying Variable that Best Explains Tariffs for Each Voting Rule

	Independent Variables are Unweighted Dependent variable: import-weighted common tariff					
	Lowest	Median	60th Pctile	QMV	80th Pctile	Highest
Employment share	1.529	-0.596	-0.735	-1.138	-0.518	-2.210
	(0.132)**	(0.303)*	(0.292)**	(0.279)**	(0.325)	(0.258)**
R-squared (within)	0.0969	0.0044	0.0072	0.0178	0.0039	0.1286
# Firms	-0.803	1.118	0.967	1.209	1.075	1.279
	(0.206)**	(0.120)**	(0.142)**	(0.113)**	(0.115)**	(0.093)**
R-squared (within)	0.0341	0.0617	0.0417	0.0866	0.0723	0.1552
Wage	-1.567	-2.222	-1.189	-0.299	1.137	1.473
	(0.475)**	(0.584)**	(0.513)*	(0.542)	(0.408)**	(0.225)**
R-squared (within)	0.0140	0.0176	0.0059	0.0004	0.0130	0.0793
Labor cost share	2.396	4.676	5.117	5.06	4.366	0.461
	(0.315)**	(0.498)**	(0.622)**	(0.659)**	(0.609)**	(0.434)
R-squared (within)	0.1054	0.0803	0.0878	0.0804	0.0717	0.0012
Intra-industry	-3.781	-1.208	-0.307	0.507	0.263	5.005
	(0.815)**	(0.943)	(0.961)	(0.904)	(0.758)	(0.642)**
R-squared (within)	0.0201	0.0020	0.0001	0.0004	0.0001	0.0490
Import penetration	0.517	-1.789	-1.479	-1.398	-1.124	-1.354
	(0.209)**	(0.292)**	(0.292)**	(0.272)**	(0.222)**	(0.149)**
R-squared (within)	0.0082	0.0620	0.0495	0.0531	0.0420	0.0978
Δ Import penetration	0.035	0.015	0.002	-0.011	0.001	-0.025
	(0.009)**	(0.02)	(0.021)	(0.017)	-0.006)	(0.006)**
R-squared (within)	0.0191	0.0004	0.0000	0.0003	0.0000	0.0102
Export share	-4.758	1.500	1.746	2.068	2.470	12.25
	(0.668)**	(1.619)	(1.713)	(1.73)	(1.698)	(1.628)**
R-squared (within)	0.0422	0.0010	0.0013	0.0016	0.0019	0.0496
Observations	1100	1100	1100	1100	1100	1100

Sources: See Table 2-2.

Note: Each table cell represents one regression, with the coefficient, heteroskedasticity-consistent standard errors in parenthesis underneath, and the within R-squared. Rows indicate the independent variable that is regressed against the tariff rate, while each column represents a voting rule. Lowest and highest refer to the models testing unanimity; median tests the median-voter model; QMV tests the qualified-majority voting (equivalent to the 71st percentile); and the 60th and 80th percentiles refer to the logrolling models. The mean regression is included for reference. Estimates marked ** are significant at the 1-percent level; those marked * are significant at the 5-percent level. All independent variables are in logs, except for change in Import penetration. The estimated equations also include a full set of industry dummies, which are not included in the calculation of the R-squared and the F-statistic, as well as a constant.

Table 2-11—Weighted Bivariate Regressions Identifying Variable that Best Explains Tariffs for Each Voting Rule

Independent Variables are Weighted by Votes in Council of Ministers Dependent variable: import-weighted common tariff						
	Lowest	Median	60th Pctile	QMV	80th Pctile	Highest
Employment share	1.529	-0.017	-0.832	-1.45	-0.754	-2.210
	(0.132)**	(0.317)	(0.329)**	(0.378)**	(0.267)**	(0.258)**
R-squared (within)	0.0969	0.0000	0.0082	0.0214	0.0076	0.1286
# Firms	-0.803	0.096	-0.319	0.541	1.063	1.279
	(0.206)**	(0.262)	(0.260)	(0.156)**	(0.127)**	(0.093)**
R-squared (within)	0.0341	0.0001	0.0014	0.0115	0.0425	0.1552
Wage	-1.567	-1.842	-2.175	-2.534	0.492	1.473
	(0.475)**	(0.584)**	(0.564)**	(0.551)**	(0.446)	(0.225)**
R-squared (within)	0.0140	0.0113	0.0164	0.0239	0.0014	0.0793
Labor cost share	2.396	5.315	4.6	5.254	4.964	0.461
	(0.315)**	(0.577)**	(0.596)**	(0.749)**	(0.630)**	(0.434)
R-squared (within)	0.1054	0.0877	0.0604	0.0747	0.0743	0.0012
Intra-industry	-3.781	-1.913	-0.58	-0.219	-0.796	5.005
	(0.815)**	(1.107)*	(0.957)	(0.974)	(1.008)	(0.642)**
R-squared (within)	0.0201	0.0044	0.0005	0.0001	0.0008	0.0490
Import penetration	0.517	-1.834	-2.015	-1.336	-1.667	-1.354
	(0.209)**	(0.305)**	(0.329)**	(0.353)**	(0.265)**	(0.149)**
R-squared (within)	0.0082	0.0608	0.0697	0.0350	0.0694	0.0978
Δ Import penetration	0.035	0.007	-0.00007	-0.004	0.002	-0.025
	(0.009)**	(0.019)	(0.017)	(0.017)	(0.006)	(0.006)**
R-squared (within)	0.0191	0.0001	0.0000	0.0000	0.0000	0.0102
Export share	-4.758	3.076	2.829	0.485	2.500	12.25
	(0.668)**	(1.644)*	(1.640)*	(1.795)	(1.731)	(1.628)**
R-squared (within)	0.0422	0.0039	0.0033	0.0001	0.0017	0.0496
Observations	1100	1100	1100	1100	1100	1100

Sources: See Table 2-2.

Note: Each table cell represents one regression, with the coefficient, heteroskedasticity-consistent standard errors in parenthesis underneath, and the within R-squared. Rows indicate the independent variable that is regressed against the tariff rate, while each column represents a voting rule. Lowest and highest refer to the models testing unanimity; median tests the median-voter model; QMV tests the qualified-majority voting (equivalent to the 71st percentile); and the 60th and 80th percentiles refer to the logrolling models. The mean regression is included for reference. Estimates marked ** are significant at the 1-percent level; those marked * are significant at the 5-percent level. All independent variables are in logs, except for change in Import penetration. The estimated equations also include a full set of industry dummies, which are not included in the calculation of the R-squared and the F-statistic, as well as a constant.

Table 2-12—Unweighted Regressions Using Characteristics of Country Whose Main Explanatory Variable Lies at Indicated Percentile (Bivariate Regression Method)

Independent Variables are Unweighted Dependent Variable: Import-Weighted Common Tariff						
	Lowest	Median	60th Pctile	QMV	80th Pctile	Highest
Employment share	-0.005	-0.058	-0.041	-0.174	-0.435	-0.131
	(0.115)	(0.113)	(0.123)	(0.143)	(0.146)**	(0.111)
# Firms	0.008	-0.045	0.111	-0.050	0.400	0.607
	(0.053)	(0.072)	(0.065)*	(0.055)	(0.108)**	(0.105)**
Wage	0.502	0.038	0.429	-0.501	-0.057	0.021
	(0.273)*	(0.284)	(0.251)*	(0.222)*	(0.212)	(0.219)
Labor cost share	0.636	1.131	1.828	1.980	0.645	0.565
	(0.238)**	(0.548)*	(0.663)**	(0.670)**	(0.266)**	(0.310)*
Intra-industry	0.276	-0.384	0.023	0.096	-0.205	0.056
	(0.338)	(0.400)	(0.410)	(0.495)	(0.344)	(0.350)
Import penetration	0.066	-0.397	-0.027	-0.124	-0.492	-0.168
	(0.117)	(0.147)**	(0.155)	(0.208)	(0.134)**	(0.150)
Δ Import penetration	0.00002	0.011	0.003	-0.009	0.001	-0.004
	(0.005)	(0.008)	(0.007)	(0.009)	(0.006)	(0.007)
Export share	-0.009	0.614	-0.159	1.036	1.450	-0.245
	(0.595)	(0.604)	(0.649)	(0.715)	(0.544)**	(0.619)
Tokyo round	-1.614	-1.676	-1.676	-1.641	-1.555	-1.416
	(0.107)**	(0.118)**	(0.125)**	(0.109)**	(0.115)**	(0.114)**
Obs	1100	1100	1100	1100	1100	1100
R-squared (within)	0.2634	0.2607	0.2612	0.2623	0.2789	0.2831
F-statistic	39.38	38.83	38.92	39.15	42.60	43.49

Sources: See Table 2-2.

Note: Panel regressions were run for 100 industries over 11 years (every other year from 1969-1989). Heteroskedasticity-consistent standard errors are in parenthesis. Estimates marked ** are significant at the 1-percent level; those marked * are significant at the 5-percent level. All independent variables are in logs, except for change in Import penetration and the Tokyo round dummy (equal to 1 starting in 1979). The estimated equations also include a full set of industry dummies, which are not included in the calculation of the R-squared and the F-statistic, as well as a constant. Each column consists of one regression, with the headings indicating the voting model. Lowest and highest refer to the models testing unanimity; median tests the median-voter model; QMV tests the qualified-majority voting (equivalent to the 71st percentile); and the 60th and 80th percentiles refer to the logrolling models. Regressions are based on data for the country whose most influential characteristic, as determined in Table 2-10, lies at the relevant percentile. The mean regression is included for reference.

Table 2-13—Weighted Regressions Using Characteristics of Country whose Main Explanatory Variable Lies at Indicated Percentile (Bivariate Regression Method)

Independent Variables are Weighted by Votes in Council of Ministers Dependent Variable: Import-Weighted Common Tariff						
	Lowest	Median	60th Pctile	QMV	80th Pctile	Highest
Employment share	-0.005	-0.050	-0.200	-0.121	-0.170	-0.131
	(0.115)	(0.133)	(0.156)	(0.146)	(0.164)	(0.111)
# Firms	0.008	0.118	-0.131	-0.134	-0.042	0.607
	(0.053)	(0.069)*	(0.070)*	(0.058)*	(0.079)	(0.105)**
Wage	0.502	0.950	-0.122	-0.452	0.069	0.021
	(0.273)*	(0.277)**	(0.317)	(0.294)	(0.230)	(0.219)
Labor cost share	0.636	1.656	0.730	1.905	0.321	0.565
	(0.238)**	(0.574)**	(0.414)*	(0.802)**	(0.271)	(0.310)*
Intra-industry	0.276	0.326	-0.082	0.480	-0.205	0.056
	(0.338)	(0.437)	(0.516)	(0.488)	(0.432)	(0.350)
Import penetration	0.066	-0.021	-0.798	-0.274	-0.951	-0.168
	(0.117)	(0.147)	(0.426)*	(0.216)	(0.370)**	(0.150)
Δ Import penetration	0.00002	0.021	0.018	0.011	-0.0003	-0.004
	(0.005)	(0.009)*	(0.010)*	(0.014)	(0.004)	(0.007)
Export share	-0.009	0.302	0.345	0.214	1.808	-0.245
	(0.595)	(0.641)	(0.766)	(0.827)	(0.826)*	(0.619)
Tokyo round	-1.614	-1.738	-1.626	-1.629	-1.664	-1.416
	(0.107)**	(0.106)**	(0.143)**	(0.123)**	(0.143)**	(0.114)**
Obs	1100	1100	1100	1100	1100	1100
R-squared (within)	0.2634	0.2709	0.2633	0.2617	0.2673	0.2831
F-statistic	39.38	40.91	39.36	39.02	40.16	43.49

Sources: See Table 2-2.

Note: Panel regressions were run for 100 industries over 11 years (every other year from 1969-1989). Heteroskedasticity-consistent standard errors are in parenthesis. Estimates marked ** are significant at the 1-percent level; those marked * are significant at the 5-percent level. All independent variables are in logs, except for change in Import penetration and the Tokyo round dummy (equal to 1 starting in 1979). The estimated equations also include a full set of industry dummies, which are not included in the calculation of the R-squared and the F-statistic, as well as a constant. Each column consists of one regression, with the headings indicating the voting model. Lowest and highest refer to the models testing unanimity; median tests the median-voter model; QMV tests the qualified-majority voting requirement (equivalent to the 71st percentile); and the 60th and 80th percentiles refer to the logrolling models. Regressions are based on data for the country whose most influential characteristic, as determined in Table 2-11, lies at the relevant percentile. The mean regression is included for reference.

Table 2-14—Regression on 1958 Country-Specific Tariffs

Dependent Variable: Import Weighted Tariff	
Employment share	-2.308
	(0.814)**
# Firms	0.997
	(0.384)**
Wage	-0.424
	(0.498)
Labor cost share	0.100
	(0.839)
Intra-industry	-2.539
	(3.161)
Import penetration	-1.224
	(0.873)
Δ Import penetration	0.139
	(0.071)*
Export share	-6.770
	(12.304)
Obs	403
R-squared (within)	0.0827
F-statistic	3.33

Sources: See Table 2-2.

Note: Panel regressions were run for 5 countries (Belgium and Luxembourg, France, Germany, Italy and the Netherlands) and 100 industries. Not all country-industry pairs had a tariff rate available. Industry and trade data are from 1976. Heteroskedasticity-consistent standard errors are in parenthesis. Estimates marked ** are significant at the 1-percent level; those marked * are significant at the 5-percent level. All independent variables are in logs. The estimated equations also include a full set of industry dummies, which are not included in the calculation of the R-squared and the F-statistic, as well as a constant. The change in import penetration refers to the change from 1976 to 1977.

Table 2-15—Unweighted Regressions Using Characteristics of Country Whose Preferred Tariff Rate Lies at Indicated Percentile (Preferred Tariff Method)

Independent Variables are Unweighted Dependent variable: import-weighted common tariff						
	Lowest	Median	60th Pctile	QMV	80th Pctile	Highest
Employment share	-0.717	-0.145	-0.619	-0.371	-0.259	0.340
	(0.156)**	(0.210)	(0.287)*	(0.285)	(0.288)	(0.340)
# Firms	0.238	0.012	0.055	0.162	0.267	-0.056
	(0.088)**	(0.097)	(0.100)	(0.139)	(0.125)*	(0.128)
Wage	-0.338	0.269	0.246	-0.569	0.030	1.509
	(0.201)*	(0.270)	(0.275)	(0.303)*	(0.292)	(0.364)**
Labor cost share	0.819	0.071	0.422	-0.165	0.455	0.189
	(0.270)**	(0.271)	(0.297)	(0.204)	(0.265)*	(0.320)
Intra-industry	-0.571	-0.181	-0.643	-0.105	0.656	-0.022
	(0.424)	(0.447)	(0.406)	(0.517)	(0.589)	(0.469)
Import penetration	-0.506	-0.210	-0.457	-0.259	-0.179	0.199
	(0.199)**	(0.193)	(0.264)*	(0.211)	(0.238)	(0.271)
Δ Import penetration	0.008	0.018	0.057	0.038	0.004	-0.014
	(0.006)	(0.015)	(0.017)**	(0.017)*	(0.009)	(0.007)*
Export share	0.031	0.651	-0.916	-0.197	1.454	0.626
	(0.580)	(0.855)	(0.943)	(0.854)	(0.811)*	(0.805)
Tokyo round	-1.556	-1.762	-1.739	-1.798	-1.739	-1.825
	(0.117)**	(0.120)**	(0.131)**	(0.123)**	(0.128)**	(0.119)**
Obs	1100	1100	1100	1100	1100	1100
R-squared (within)	0.2818	0.2519	0.2640	0.2552	0.2643	0.2906
F-statistic	43.21	37.07	39.49	37.72	39.57	45.11

Sources: See Table 2-2.

Note: Preferred tariff rates were predicted using the results from a regression of 1958 country-specific tariffs against 1976 industry and trade characteristics (see Table 2-14). Panel regressions were run for 100 industries over 11 years (every other year from 1969-1989). Heteroskedasticity-consistent standard errors are in parenthesis. Estimates marked ** are significant at the 1-percent level; those marked * are significant at the 5-percent level. All independent variables are in logs, except for change in Import penetration and the Tokyo round dummy (equal to 1 starting in 1979). The estimated equations also include a full set of industry dummies, which are not included in the calculation of the R-squared and the F-statistic, as well as a constant. Each column consists of one regression, with the headings indicating the voting model. Lowest and highest refer to the models testing unanimity; median tests the median-voter model; QMV tests the qualified-majority voting (equivalent to the 71st percentile); and the 60th and 80th percentiles refer to the logrolling models. The mean regression is included for reference.

Table 2-16—Weighted Regressions Using Characteristics of Country Whose Preferred Tariff Rate Lies at Indicated Percentile (Preferred Tariff Method)

Independent Variables are Weighted by Votes in Council of Ministers Dependent variable: import-weighted common tariff						
	Lowest	Median	60th Pctile	QMV	80th Pctile	Highest
Employment share	-0.717	-0.232	-0.415	-0.378	0.097	0.340
	(0.156)**	(0.332)	(0.335)	(0.279)	(0.317)	(0.340)
# Firms	0.238	-0.103	-0.109	0.191	0.257	-0.056
	(0.088)**	(0.143)	(0.150)	(0.147)	(0.178)	(0.128)
Wage	-0.338	-0.007	-0.514	-0.657	-0.111	1.509
	(0.201)*	(0.341)	(0.263)*	(0.270)**	(0.401)	(0.364)**
Labor cost share	0.819	0.050	0.045	0.058	0.654	0.189
	(0.270)**	(0.307)	(0.265)	(0.217)	(0.276)**	(0.320)
Intra-industry	-0.571	-0.241	0.017	-0.272	-0.385	-0.022
	(0.424)	(0.571)	(0.492)	(0.554)	(0.579)	(0.469)
Import penetration	-0.506	-0.309	-0.490	-0.216	-0.123	0.199
	(0.199)**	(0.280)	(0.253)*	(0.219)	(0.239)	(0.271)
Δ Import penetration	0.008	0.024	0.037	0.013	0.005	-0.014
	(0.006)	(0.016)	(0.016)**	(0.014)	(0.007)	(0.007)*
Export share	0.031	0.195	0.164	0.291	0.784	0.626
	(0.580)	(0.905)	(0.949)	(0.863)	(0.881)	(0.805)
Tokyo round	-1.556	-1.810	-1.799	-1.771	-1.719	-1.825
	(0.117)**	(0.135)**	(0.127)**	(0.116)**	(0.144)**	(0.119)**
Obs	1100	1100	1100	1100	1100	1100
R-squared (within)	0.2818	0.2532	0.2615	0.2530	0.2663	0.2906
F-statistic	43.21	37.34	38.99	37.29	39.96	45.11

Sources: See Table 2-2.

Note: Preferred tariff rates were predicted using the results from a regression of 1958 country-specific tariffs against 1976 industry and trade characteristics (see Table 2-14). Panel regressions were run for 100 industries over 11 years (every other year from 1969-1989). Heteroskedasticity-consistent standard errors are in parenthesis. Estimates marked ** are significant at the 1-percent level; those marked * are significant at the 5-percent level. All independent variables are in logs, except for change in Import penetration and the Tokyo round dummy (equal to 1 starting in 1979). The estimated equations also include a full set of industry dummies, which are not included in the calculation of the R-squared and the F-statistic, as well as a constant. Each column consists of one regression, with the headings indicating the voting model. Lowest and highest refer to the models testing unanimity; median tests the median-voter model; QMV tests the qualified-majority voting (equivalent to the 71st percentile); and the 60th and 80th percentiles refer to the logrolling models. The mean regression is included for reference.

Table 2-17—Decisive Country under Highest Percentile for Specific Industries, Preferred Tariff Method, NACE 221: Iron and Steel Industry

	1st Enlargement (1973)		2nd Enlargement (1981)		3rd Enlargement (1986)	
	1971	1973	1979	1981	1985	1987
High Tariff	Italy	*UK*	UK	UK	UK	UK
	Germany	Italy	France	France	Italy	*Spain*
	France	Germany	Italy	Italy	France	France
	Belux	France	Germany	Germany	Germany	Italy
		Denmark	Denmark	*Greece*	Greece	Germany
		Belux	Belux	Denmark	Denmark	*Portugal*
				Belux	Belux	Greece
						Denmark
Low Tariff						Belux
No data		Ireland	Ireland	Ireland	Ireland	Ireland
	Netherlands	Netherlands	Netherlands	Netherlands	Netherlands	Netherlands

Note: Belux refers to Belgium and Luxembourg. The first enlargement consisted of Ireland, the UK, and Denmark; the second enlargement brought in Greece; and the third enlargement consisted of Spain and Portugal. Countries in bold and shaded are the decisive countries, while those in italics are the new members. The decisive country is the one whose predicted preferred tariff lies at the highest percentile.

Table 2-18—Decisive Country under Highest Percentile for Specific Industries, Preferred Tariff Method, NACE 436: Knitting Industry

	1st Enlargement (1973)		2nd Enlargement (1981)		3rd Enlargement (1986)	
	1971	1973	1979	1981	1985	1987
High Tariff	Germany	Germany	Germany	France	France	*Spain*
	Italy	Italy	France	Germany	Germany	France
	France	France	Italy	Belux	Italy	Germany
	Belux	Belux	UK	Italy	Greece	Italy
	Netherlands	*UK*	Belux	*Greece*	UK	Belux
		Netherlands	Netherlands	UK	Netherlands	UK
		Ireland	Ireland	Netherlands	Belux	Greece
		Denmark	Denmark	Ireland	Ireland	Netherlands
				Denmark	Denmark	Denmark
						Portugal
Low Tariff						Ireland

Note: Belux refers to Belgium and Luxembourg. The first enlargement consisted of Ireland, the UK, and Denmark; the second enlargement brought in Greece; and the third enlargement consisted of Spain and Portugal. Countries in bold and shaded are the decisive countries, while those in italics are the new members. The decisive country is the one whose predicted preferred tariff lies at the highest percentile.

Table 2-19—Overall Decisive Country under Highest Percentile, Preferred Tariff Method

	1st Enlargement (1973)		2nd Enlargement (1981)		3rd Enlargement (1986)	
	1971	1973	1979	1981	1985	1987
High Tariff	Germany	Germany	Germany	Germany	Germany	*Spain*
	France	France	France	France	France	*Portugal*
	Italy	Italy	Italy	Italy	Italy	France
	Belux	*UK*	UK	UK	UK	Germany
	Netherlands	Belux	Belux	*Greece*	Greece	Italy
		Netherlands	Ireland	Belux	Belux	Greece
		Ireland	Netherlands	Ireland	Netherlands	UK
		Denmark	Denmark	Netherlands	Ireland	Belux
				Denmark	Denmark	Ireland
						Netherlands
Low Tariff						Denmark

Note: Belux refers to Belgium and Luxembourg. The first enlargement consisted of Ireland, the UK, and Denmark; the second enlargement brought in Greece; and the third enlargement consisted of Spain and Portugal. Countries in bold and shaded are the decisive countries, while those in italics are the new members. The decisive country is the one whose predicted preferred tariff lies at the highest percentile.

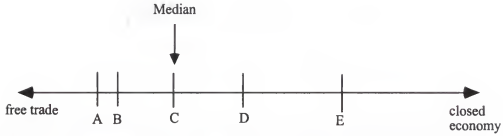

Figure 2-1. Decisive Country Under Majority Voting—Original Members

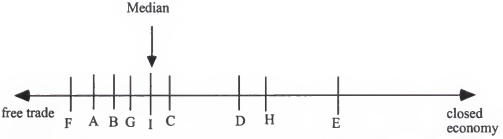

Figure 2-2. Decisive Country Under Majority Voting—First and Second Enlargements

Figure 2-3. Decisive Country Under Majority Voting—Third Enlargement

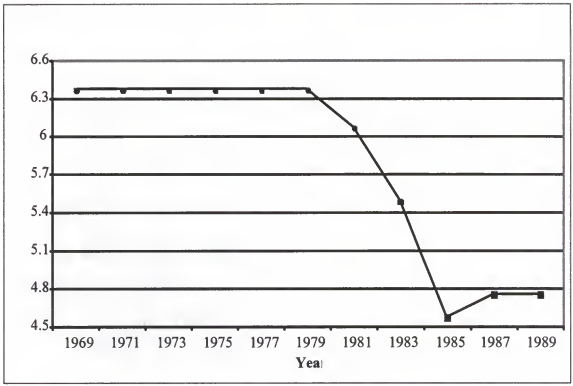

Figure 2-4: Tariff Rates NACE 221, Iron and Steel Industry (1969-89)

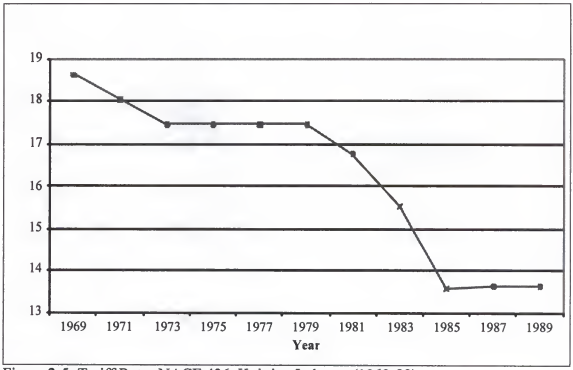

Figure 2-5: Tariff Rates NACE 436, Knitting Industry (1969-89)

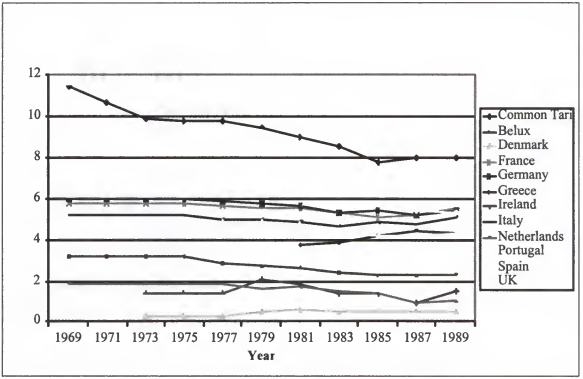

Figure 2-6: Actual vs. Member Countries' Predicted Preferred Tariff Rates

CHAPTER 3
SETTING THE COMMON TARIFF: DOES THE EUROPEAN UNION ACT AS A COUNTRY OR A GROUP OF COUNTRIES

Introduction

Since the 1987 Single European Act (SEA), the European Union has been rapidly moving toward closer integration. The SEA extended the power of the EU in areas such as social, environment, and research and technology policy; it introduced a legal basis for cooperation in economic and monetary policy as well as foreign policy, and extended decision-making on the basis of qualified majority voting. The 1992 Treaty on European Union (also known as the Maastricht Treaty) furthered the integration process by removing obstacles to the Single Market, which allows for the free movement of capital, goods, services and persons, increasing the power of the European Parliament (Weidenfeld and Wessels 1997). It also established the principle of EU citizenship, adding the right to vote and stand as a candidate in European and local elections (European Commission 1999). Furthermore, the 1999 Treaty of Amsterdam strengthened the EU's ability to undertake joint foreign policy actions, so that the EU could now legislate on immigration, civil law, civil procedure; it also established a system of individual rights and increased the EU's power in areas such as employment, health, consumer rights and the environment (European Commission, 1999). Finally, in January 2002, 12 of the 15 member countries adopted a common currency, the euro.[1]

Such developments imply that more and more, the EU is resembling a single unified country, rather than a group of countries participating in a customs union. The question that arises then is, has policy-making indeed moved toward the EU-level? To

[1] The 12 countries are Austria, Belgium, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, and Spain.

my knowledge, so far only anecdotal evidence has been furnished to support this shift to Brussels, but no one has attempted to provide empirical evidence on this phenomenon. This paper seeks to correct this deficiency. More specifically, it uses a unique dataset to test whether post-SEA tariff setting in the EU reflects pan-European lobby influences or whether the EU is still acting like a collection of separate countries.

The tariff determination process seemed ideally suited for such an analysis. From its inception, authority on trade policy has been relegated to the EU-level, with a common external tariff adopted in 1968. However, until 1987, countries were allowed to veto the proposals they found unacceptable in the Council of Ministers if the matter was judged to be vital national interest under the Luxembourg Compromise (Hine 1985). As a result, opponents to liberalizing trade could lobby their national governments to prevent a decision from being made. This meant that despite a common tariff, power still rested in the hands of the individual national governments. Following the 1987 SEA, though, the European Commission[2] saw an increase in its power as countries lost their ability to veto proposals in the Council of Ministers (with certain exceptions) as decision-making on the basis of qualified majority voting was extended. As a result, interest groups began to direct their resources toward lobbying the Commission as well, so as to affect policy at the agenda-setting stage, rather than just at the voting-stage. Indeed, there are now about 3000 interest groups in Brussels, with more than 500 of these being European and international federations, 50 offices representing Länder, regional, and local authorities, and 200 individual firms with direct representation (European Commission 1993).

[2] The European Commission proposes policies and legislation; is responsible for administration; and conducts trade negotiations on behalf of the EU and on the basis of a mandate agreed to by the member governments. As a result, member governments do have some indirect power over Commissioners, as they can refuse to reappoint a Commissioner if he or she does not follow the national position (Widgrèn 1994). Thus, in order for the Commission to achieve anything, it must mediate a compromise between the national governments. In this, it is influenced by a committee of national officials, as well as the residual allegiances of the Commissioners (Winters 1994).

What this implies is that if the EU is indeed behaving like a single country, we should observe firms from each country lobbying for protection in Brussels. In other words, each EU country would be behaving like a U.S. state, which must lobby Washington for protection, rather than lobbying its state capitals. This means that the appropriate specification in this case would be one similar to the one used to explain U.S. tariffs. If tariffs are assumed to be a function of various political-economy characteristics, this specification requires adding up, for instance, the number of firms in the textile industry in France with the number of firms in that industry in Germany and so forth. On the other hand, if the EU is acting merely like a group of countries, lobbying should occur at the national level, with member countries then bargaining at the Council of Ministers to determine the common tariff. This implies a two-stage process, similar to Putnam's (1988) conceptualization of "two-level" games. In the first stage, interest groups lobby their national governments for protection of the industries they represent. Government then chooses a tariff rate for that industry to maximize a political support function, as in Hillman (1982). This tariff rate becomes the country's preferred tariff rate. In the second stage, countries vote in the Council of Ministers to determine the overall EU tariff rate. This resulting tariff rate, according to a "decisive voter" model, will be the duty preferred by the decisive country.

Which country is decisive in turn depends on how decisions are made. If it is unanimity,[3] the decisive country will be the one with the highest or lowest preferred tariffs, since those are the ones most likely to veto any proposal. In the case of majority voting, it will be the country whose preference lies at the median; if it is qualified majority, the decisive country will be the one whose preferred tariff rate lies at the 71st percentile. Finally, tariff determination could also reflect logrolling, also known as vote

[3] Of course, as mentioned before, the unanimity requirement was abolished in 1987 in favor of qualified majority voting. Even so, member countries still often attempt to find a general consensus around an issue, without having to resort to a formal vote (Meunier 2000).

trading. It has been observed that legislators oftentimes vote for legislation against the interests of their constituents, implying the presence of unobserved factors that influence votes. This can occur if legislators are trading away their votes on one issue for votes on another that is of greater concern to their constituents. Previous empirical work on logrolling has focused on identifying logrolling in the U.S. Congress.[4] Stratmann (1992), for instance, estimates a three-equation simultaneous probit model explaining the vote on issues where logrolling is expected to occur. To test for the presence of logrolling, he inserts the predicted vote value for one issue into the regression equation estimating the vote value on another issue. Another test consists of examining whether the residuals of the equations explaining the vote for the issues involved in a logroll are correlated. This paper takes a different, but intuitive approach that is novel in the literature. If one country has a strong preference for a high tariff on one good, and another country wants a high tariff on another good, they could logroll on both tariffs and end up with a higher tariff on both goods. In other words, if the decision rule used is majority voting, logrolling implies that the decisive country would be the one whose preference lies at a percentile higher than the 50^{th}, such as the 60^{th} percentile. If logrolling occurs with respect to qualified majority, the decisive country would have a tariff rate lying at a percentile higher than the 71^{st} (for instance the 80^{th} percentile).[5] This means that I am considering logrolling as another possible decision rule, rather than as a means to pass legislation.

To answer the question of whether the EU is behaving like a country or a group of countries, then, I test these various decisive-country models against a specification that treats the EU as a single country. The analysis uses a dataset containing 94 manufacturing industries covering the 1987-1999 period, which includes one official enlargement in 1995, and the unification of Germany in 1990, which could also be considered an

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[4] See Stratmann (1997) for a survey.

[5] Note that because of the way logrolling is defined, finding that decisions take place at the highest percentile can also imply the presence of logrolling, since it lies above the 71^{st} percentile.

enlargement. An advantage of using panel data in this case is that these enlargements provide for an additional source of variation.

Results suggest that the EU is indeed behaving like a single country when setting the common tariff. These results are robust to various specification tests, and to using different methods for determining the decisive country. The first method, based on Romer and Rosenthal (1982), consists of choosing the country based on where each industry characteristic falls in the distribution. In other words, if decisions are made at the median, the data used in the regressions are those that fall in the median value for the characteristic for each year and each industry.[6] The second method consists of determining which of the industry characteristics best explains tariffs, and then using it to identify the decisive country. This is necessary because different countries might have industry characteristics at the relevant percentile, so that it becomes difficult to determine which one is decisive. The final method consists of using a regression explaining each country's tariff rate from 1958, the year the EU was formed to predict a country's preferred tariff rate (based on current data), or the tariff the country would set if it were not part of the customs union. The decisive country then is the one whose preferred tariff rate lies at the appropriate percentile.

This paper is divided as follows: the next section develops a test for determining which political-economy model best explains tariff rates. The third section describes the estimation procedure and the variables used, as well as the predictions. The fourth section provides the empirical results, while the fifth section subjects these results to a variety of sensitivity analyses. The last section summarizes the paper.

Theoretical Background

Tariff determination in the European Union for the post-SEA period can be modeled in two ways. If the EU is behaving like a group of countries—in other words, if

[6] Romer and Rosenthal (1982) searched over percentiles of the income distribution.

the European integration process is still "shallow" (Cadot et al. 1999)—then the EU's trade policy reflects bargaining between the member countries. Because each country is also subject to lobbying pressure, tariff-determination can be modeled as the outcome of a two-stage process. In the first stage, interest groups lobby their national governments for protection of the industries they represent. These groups are considered to be successful in their endeavor if protection becomes a part of the "national" interest, so that the government itself now becomes a lobbyist at the EU level in order to secure a recommendation for higher tariffs from the European Commission. In the second stage, protection of the concerned industries is voted upon at the Council of Ministers, where a decision is reached via unanimity or qualified majority, or some other voting rule. On the other hand, if integration is "deep" (Cadot et al. 1999), the EU's trade policy is determined by a pan-European institution (the European Commission), which in turn is subjected to influence by pan-European lobbies, implying a specification that aggregates each country's industry characteristics.

Decisive Country

Stage one: interest groups lobby national governments

Recent empirical work on the political-economy of trade policy have used the Grossman and Helpman (1994) model to explain observed patterns of protection.[7] This approach, however, assumes that all lobbying occurs in the form of campaign contributions, thus ignoring the role of information transmission, and other forms of lobbying that are not so directly observed.[8] The Grossman and Helpman model, though, is based on the political-support function approach, first developed by Hillman (1982), and grounded on the Stigler-Peltzman economic theory of regulation. Because it makes no assumption about the type of lobbying that occurs, this model is more appropriate as a basis for examining tariff formation in the EU. Given that tariff determination is not

[7] Goldberg and Maggi (1999), and Gawande and Bandyopadhyay (2000), for instance.
[8] See Rodrik (1995).

directly observed in the EU, it becomes necessary to examine the issue empirically. Furthermore, this paper does not focus on explaining the observed pattern of protection. Rather, it uses variables that have been suggested in the literature to test new hypothesis about government decision-making.

Based on the Hillman (1982) model, then, I assume that tariff-setting politicians in each country maximize their overall political support by choosing the tariff rate that produces a politically optimal distribution of the economic rents that can be obtained by the participants in each affected market. In other words, the government in each country selects a vector of tariff rates to maximize a political support function. Letting p_{it} denote the relative price of industry $i=1,...n$ at time t; p_{it}^* be the world price of that industry's good (so that $p_{it}-p_{it}^* = t_{it}$, the tariff rate on good i at time t), and $\pi_{it}(\cdot)$ be the profit function for that industry, the political support function can be written as

$$PS_{it} = f\left(\pi(p_{it}) - \pi(p_{it}^*), p_{it} - p_{it}^*\right) \quad (1)$$

where the first argument captures the gain in profits resulting from an increase in tariffs and the second term represents the loss in consumer welfare resulting from the higher tariff. Hence, in each EU member country, there are three groups that play a role in setting tariff levels: the owners of the domestic factors of production specific to the production of the commodity (who seek to maximize their profits); the domestic consumers of the commodity (who seek to maximize their utility); and the government (which seeks to maximize political support). The solution to the maximization problem, then, will be the country's preferred tariff rate for the particular commodity in question, which can be written as

$$t_{it} = f(PE_{it}) \quad (2)$$

where PE_{it} denotes the political-economy characteristics that serve as a proxy for an industry's political influence. The structure of the political support function is, like Godek (1985), based on both the economic theory of regulation and comparative advantage. The former suggests which characteristics should influence an industry's

ability and efficiency in lobbying for protection, while the latter indicates that industries will have an incentive to lobby if they are at a comparative disadvantage (due to import competition). These are discussed in more detail in the third section.

Stage two: voting in the Council of Ministers

In the second stage of the model, then, each minister of a member country arrives at the relevant Council meeting with his or her country's preferred tariff level, as determined through lobbying in the first stage. Unlike the standard special interest model, an industry in one country cannot buy votes in another country and thereby alter its preferred tariff rate, so that the only way it can affect the outcome is by lobbying its own government. In other words, an industry in France can only affect France's preferred tariff rates, not the preferred tariff rates of other countries. Deliberations ensue and, ignoring for the moment the possibility of logrolling, a vote is conducted to determine the overall EU tariff rate. This resulting tariff rate, according to a "decisive voter" model, will be the duty preferred by the decisive country. Which country is decisive in turn depends on how decisions are made. If it is a majority-voting process, the decisive country will be the median. In other words, if decisions are made via majority voting, the tariff rate will be

$$t_{it}^{md} = f\left(PE_{it}^{md}\right) \tag{3}$$

where the superscript *md* denotes the median. Hence, the country whose tariff rate lies at the median will be the one whose political-economy characteristics lies at the median.

Under the EU's qualified majority rule, the decisive country will be the one whose preferred tariff rate lies at the 71st percentile; and if it is unanimity, the decisive country will be the one lying at either end of the distribution. Furthermore, since bargaining tends to occur between countries, tariff determination could also reflect logrolling, or vote trading. If *(x,y)* and *(z,w)* are mutually exclusive issues, and letting voter preferences with respect to each pair be separable and each voter vote sincerely, a

logrolling situation exists if xPy and zPw, but $ywPxz$, where P denotes social preference as defined by the voting rule used (Stratmann 1997). This means that if France very much wants a high tariff on wine and Portugal strongly prefers a higher tariff on textiles, they could logroll on both tariffs and end up with a higher tariff than that preferred by the median country. Taking logrolling, then, as another decision rule, if decisions are made via majority voting, logrolling implies that decisions are made at a higher percentile, such as the 60th percentile, whereas if it is qualified majority voting, they are made at a percentile higher than the 71st (such as the 80th).

Pan-European Lobbying

The 1987 SEA, and the subsequent adoption of the Single Market in 1993, suggests that the EU may have moved toward "deep integration." This means that the customs union's trade policy is now determined by a pan-European agency—namely, the European Commission—which in turn is subject to influence by pan-European lobbies (Cadot et al. 1999). This implies a model that considers the EU as a country, rather than as a group of countries, which is precisely the type of model that has been used to explain tariff formation in the United States. As in the first stage of the decisive-country framework, the outcome can be modeled using the political-support function approach. This time, however, it is the European Commission that selects the vector of tariff rates to maximize a political support function, with the solution to the maximization problem being the EU's preferred tariff rate for a particular commodity. The Commission is then weighing increased support from firms across the EU against the dissatisfaction from European consumers due to an increase in protection. Since each country is now taken to be analogous to a state in the U.S., their industry characteristics are aggregated across the EU.

Estimation

Variables

In order to determine which voting model fits best in explaining the pattern of protection in the European Union, tariff rates are assumed to be a function of various economic and political factors, as in equation (2). The political-economy characteristics included are the number of firms in the industry, the employment share of sector *i* in the country's total employment, the labor intensity, the wage per worker, intra-industry trade, the import penetration ratio, the change in the import penetration ratio and the share of exports in the industry's production. For a description of variable construction, see Table 3-1. The sample includes 658 observations for 94 3-digit NACE Rev. 1 industries (listed in Appendix Table B-1) and 7 years (every other year from 1987-99).

Tariffs

Tariffs were obtained from various issues of the *Official Journal of the European Communities*, which publishes the common tariff schedule annually. In general, these duties enter into force on January 1 of the following year. The data were collected for the publication year, rather the years when the tariffs entered into force.

Import duties are expressed in three ways: as *ad valorem* tariffs equal to a percentage of the product's value; as specific tariffs per unit weight, volume, or number of pieces; or as a combination of the two. In all cases, tariffs are based on the CIF value (cost, insurance, freight). Duties are expressed as conventional duties, meaning that they are applicable to imported goods originating in countries which are contracting parties to the GATT, or with which the EU has concluded agreements containing the most-favored nation tariff. Autonomous duties are also reported; these are applicable whenever conventional duties are higher or non-existent. For the purposes of this paper, conventional *ad valorem* duties are used. Data were collected for every other year, beginning with the 1987 issue, which was the first year tariffs were classified in the Combined Nomenclature.

Tariff rates data for this period were in the Combined Nomenclature (CN), which needed to be converted to the 3-digit level of NACE Rev. 1. NACE Rev. 1 is a 4-digit classification that was drawn up in 1990 and designed to be a more detailed version of ISIC Rev. 3. No correspondence table was available to match NACE Rev. 1 to CN. However, NACE Rev. 1 is directly related to the 6-digit CPA (Statistical Classification of Products by Activity), matching it exactly at the 4-digit level. A correspondence table between CPA and CN is available from the EU's RAMON nomenclatures server.

Some of the NACE Rev. 1 categories corresponded to only one CN, but in most cases, there were several CN that made up one NACE Rev. 1 industry. Rather than simply averaging all the corresponding tariff rates, which would have made it difficult to accurately reflect the size of changes in the level of protection, it was decided to add up the EU's exports to and imports from the rest of the world in 1988 for each CN, then find the percentage of trade each of those products represented within each NACE Rev. 1. All products that accounted for at least 10% of the trade in an industry were used in determining the tariff for that industry. For the industries where no product met that threshold, or for those where all the products meeting that threshold, taken together, did not account for at least 50% of the trade, all the products with the highest trade percentage and which, when added up, met the threshold, were used. Tariff rates were then aggregated using the import share as weight.

In 1997 and 1999, conventional duties for Chapters 1-24 were split into two periods, January 1-June 30 and July 1-December 31. For these cases, the tariffs were simply averaged to reflect the tariff for that particular year.

This period also had a number of cases where a particular category split into two or more categories with different tariff rates. For instance, CN 3901 20 00 (Polyethylene having a specific gravity of 0.94 or more) split into two categories in 1997: 3901 20 10 and 3901 20 90. Duties for the former were 0 in 1997, while those for the latter were 10.1. The tariff for the whole category was reported to be the average of the two, or 5.05.

Industry

Data for the period were taken from Eurostat's Structural Business Statistics, which is part of the NewCronos database. Because the data were not available at the 4-digit level for the period before 1995 and because of the high frequency of missing data, it was decided to use the 3-digit level of NACE Rev. 1 for the purposes of this paper.

Because the industry data contained missing data, I collected data for every year, rather than every other year. In cases where the previous and next year's data were available, I used them to interpolate the values. This was not always possible, since there were instances where only the previous year's or the next year's was available (but not both). In those cases, I simply used the data that were available to fill in what was missing. I also established a criterion to determine whether I should keep an industry or drop it for lack of data. As long as there were at least seven out of the total possible 14 countries available,[9] and sufficient years for interpolation to be used and as long as there were both industry and trade data available, I kept the industry. In the end, out of 120 industries, 94 industries were used.

Another complication arose from the fact that data before 1995 refers to enterprises employing 20 or more persons for all countries except Spain, Portugal, and Ireland. Data on firms employing less than 20 persons are available starting in 1995, though not for all country-industry pairs. In order to adjust the data to include small firms, I calculated, for each variable, the proportion represented by the small firms—for instance, in the case of production, I calculated the production share of small firms in total production for the three years available. These shares did not change much from one period to the next, so I averaged them and used them to calculate the values for all firms.

[9] I combine the industry data for Belgium and Luxembourg because the trade data is not provided for each country separately.

Trade

Data on exports and imports comes from Eurostat's Intra- and Extra-EU trade (Combined Nomenclature), Supplement 2. The data were aggregated from the 8-digit CN into the 3-digit NACE Rev. 1.

One problem with matching the trade data to the industry data is that the trade data refer to all firms, whereas, as mentioned above, the industry data are provided only for firms employing 20 or more persons. As indicated, I performed a correction to alleviate the problem and as a robustness check, I estimate the regressions for the 1995-99 period only and obtain the same qualitative results.

Predictions

As mentioned previously, this paper is not focused on explaining the observed structure of protection across industries, so the criterion for choosing the explanatory variables is less crucial. The variables chosen are the ones that have been used in previous empirical work and are mostly based on the list of key findings provided in Rodrik (1995). In particular, the literature predicts that protection is higher in an industry the:

• Larger the industry: the larger the industry seeking protection, the greater is the incentive to observe and perhaps join in the tariff-setting process. The size of the industry is measured as the share of employment in the industry.

• The smaller the number of firms: a smaller number of firms alleviates the free rider problem in coordinating a lobby, thus increasing the level of protection. Many studies, however, find a positive, rather than a negative, effect.[10] Hillman (1991) and Hillman et al. (2001) argue that lobbying can be regarded as a case of private provision of a public good, since when successful, it provides a public good-type benefit—increased protection—to all firms. A larger contribution by one firm does not necessarily decrease

[10] See Potters and Sloof (1996) for a survey of empirical work.

the contribution of other firms; as a result, increasing the number of firms in an industry can either increase or decrease the overall lobbying effort. Pecorino (1998) analyzes this issue in a repeated tariff lobbying game where cooperation may be maintained through the use of trigger strategies, so that the difficulty of maintaining cooperation is measured by the critical value of the discount parameter. He finds that the effect of an increase in the number of firms in the industry on the ability of maintaining cooperation is indeterminate.

• The lower the wage: disadvantaged industries often receive more protection. An industry is disadvantaged if it is a low-skill and hence low-wage industry (Trefler 1993).

• Higher its labor-intensity: the more labor-intensive an industry, the more labor votes it has. This is measured by the labor cost share.

• The lower the intra-industry trade: industries seeking protection will find their task harder if they must counter not only consumer dissatisfaction, but also producers who purchase their goods as intermediates (Marvel and Ray, 1987).

• The higher the import penetration: the higher the import penetration, the more will the affected industry lobby for protection, so as to decrease competition and maintain its market share (Trefler 1993). The theoretical literature, however, predicts an ambiguous relationship. In particular, the Grossman and Helpman (1994) political-economy model, which stresses the influence interest groups exert through campaign contributions, predicts that, if industries are organized, protection should be higher in industries with low import penetration, and if they are not organized the relationship between protection and import penetration should be positive. Models predicting a negative relationship include Mayer (1984), Hillman (1982) and Findlay and Wellisz (1982). Another problem with this variable is its potential endogeneity, since a high tariff can lower import penetration. This will be dealt with below.

• The greater the rise in import penetration: Declining sectors (those with large increases in import penetration) tend to receive more protection so as to reduce adjustment costs (Olarreaga et. al, 1999).

• The smaller the share of exports in production: export-oriented industries do not require protection either because they face no import competition or because, with intra-industry trade, protection will provoke unwanted foreign retaliation (Trefler 1993).

Finally, a dummy is included to control for the Uruguay trade round, which occurred more or less at the same time as the third enlargement.[11] This is predicted to have a negative relationship with tariffs, since each trade round resulted in multilateral tariff reductions. I use the trade round dummy rather than year fixed effects because it generates a clear prediction.

Empirical Estimation

Decisive country

Using the industry's characteristics described in the previous section for each country, the decisive country for each industry can be found for each type of decision rule, namely, the majority, the qualified majority and the unanimity rule, as well as various logrolling options. In the first case, the decisive country is the median country; in the second, the decisive country is the one whose industry characteristics lie at about the 71st percentile in the industry distribution; in the third case, the country desiring the highest tariffs (i.e., the one lying at the highest end of the distribution) or the country desiring the lowest tariff will be the decisive one.[12] In the logrolling cases, the decisive country is the one whose characteristics lie at a percentile higher than the median, such as for instance the 60th percentile, or above the 71st percentile, such as the 80th percentile. In other words, the values for the variables actually used in the regressions are those lying at

[11] The Uruguay Round began following the accession of Spain and Portugal in 1986, and concluded in 1993.

[12] This is because either one will be most likely to veto a change in tariffs that goes against their preference.

the relevant percentile, where the percentile used can be ascending or descending, depending on the sign prediction. To illustrate this, recall from the previous section that while the share of industry employment in the country, the labor cost share, the import penetration and the change in import penetration were all predicted to be positively related to the tariff rates, the number of firms, the wage rate, intra-industry trade, and the export intensity were anticipated to exhibit a negative relationship. For those with the positive relation, the percentile is, in this case, the 60th; but for those showing a negative relationship, the appropriate percentile is the 40th rather than the 60th.

The equation to be estimated is, then

$$t_{it} = \alpha + \beta C_{it}^{pct} + \delta U_t + \nu_i + \varepsilon_{it} \qquad (4)$$

where t_{it} denotes the tariff rate for industry i and time t; C_{it}^{pct} is the vector of the decisive-country's characteristics at percentile pct; U_t is a dummy indicating the conclusion of the Uruguay Round (equal to 1 for 1993-99 and 0 elsewhere); ν_i is the industry-specific fixed effect, which is included to account for any time-invariant unobserved factors; and ε_t is the error term. Two forms of this equation are estimated. In one version, the independent variables are unweighted. In the other version, the independent variables are weighted by the share of votes the country has in the Council of Ministers, so as to give greater weight to countries with a greater share of votes. The number of votes each country has is shown in Table 3-2. Summary statistics are reported in Table 3-3.

EU-wide lobbying

To examine whether tariff determination reflects EU-wide lobbying, I use the same specification that has been used to describe U.S. tariff formation, that is, one where industry characteristics are aggregated over the EU. Hence, the variables on industry characteristics described above will be aggregated so as to represent the characteristics of the EU as a whole rather than a decisive country within the EU. In other words, the number of firms in the textile industry in Portugal, for instance, will be added to the number of firms in France, Italy, Greece, and so forth. To put it differently, instead of

using the number of firms in an industry for one country, I will be now using the number of firms in an industry for the entire EU. The transformed variables are then regressed against the tariff rates according to

$$t_{it} = \beta_1 + \beta_2 C_{it} + \beta_3 U_t + \eta_i + \gamma_{it} \quad (5)$$

where t_{it} denotes the tariff rate for industry i and time t; C_{it} is the vector of EU characteristics; U_t is a dummy indicating the conclusion of the Uruguay Round (equal to 1 for 1993-99 and 0 elsewhere); η_i is the industry-specific fixed effect; and γ_{it} is the error term. No weighted specification is constructed in this case, since if lobbying is taking place at the European level, the number of votes each country has in the Council of Ministers is not relevant.

Empirical work on the political-economy of protection generally makes an assumption regarding the functional form of the estimated regression equation. Theory, however, provides no guidance as to what form it should take, so the most sensible approach would be to test various functional forms against each other and make a selection on that basis. With this in mind, I performed J-tests and P_E tests[13] to determine whether a linear, a logarithmic, or a model where the dependent variable is linear but the independent variables are in logs (lin-log) is the most appropriate functional form. The results are presented in Appendix Tables B-2 and B-3. In both cases, the log specification is the preferred one, as it rejects the linear form in all cases with the exception of the median in the unweighted specification and the lin-log in all but two of the models, again under the weighted specification, while neither of those are able to reject it in more than four out of the seven models.

Results

Results are reported in Tables 3-4 and 3-5 for the seven models and two specifications. To account for any unobserved industry-specific, time-invariant

[13] A P_E test is an extended version of the J-test used to test a linear model versus a log-linear model. See Davidson and MacKinnon (1981) and MacKinnon et al. (1983).

determinants of the tariff rate, all regressions include an industry-specific fixed effect. In Table 3-4 the independent variables are unweighted; in Table 3-5 the variables are weighted by the share of votes each country has at a particular time in the total number of votes in the Council of Ministers.

In both cases, the EU-wide specification seems to fit best, as indicated by the within R-squared. In the discussion that follows, the emphasis is placed on this case only.

The share of industry employment in the country does not have the predicted sign, but is insignificant. On the other hand, the number of firms is highly significant and negative, indicating the presence of free riding.

Both the wage and the labor cost share are significant, though the latter has a negative, rather than the expected positive sign. Low wage industries in general receive greater protection because they tend to be disadvantaged. Also, because of high union membership in Europe, it seems reasonable that labor should play an important role in determining protection.

A higher import penetration does not seem to induce the industry to lobby harder for protection. Though this result contradicts previous empirical findings, it does coincide with the theoretical literature and, according to Grossman and Helpman (1994), it suggests that sectors are organized. On the other hand, the change in import penetration is insignificant, though it has the expected positive sign.

The share of exports in production and the Uruguay Round dummy do have the predicted sign, but are both insignificant.

These results then suggest that the U.S.-type specification, where industry characteristics are averaged over the EU, does fit better than the decisive country specification. There is also an indication that changes in the European common tariff are best explained by the number of firms, the wage rate, the labor cost share, and the import penetration, as these were the most consistently significant variables.

Sensitivity Analysis

Import Penetration Endogeneity

Some of the variables used as indicators of political influence present a potential endogeneity problem. Specifically, import penetration is affected by tariff rates. The higher the tariffs, the less will domestic consumers buy of imported goods, resulting in a decrease in imports altogether. It would be desirable to consider the joint determination of import penetration levels with tariff protection and perform a simultaneous estimation of the two equations (Trefler 1993). Due to data restrictions, however, such an approach is not possible.[14] The first column in Tables 3-6 and 3-7, however, presents the results of running the same regressions as before, only this time without the import penetration and the change in import penetration variables. What is found is that the results are unchanged in that the EU-specification still performs better than the decisive country framework.

Tariff Weighting

Now, one problem that has been pointed out repeatedly in the literature concerns the use of import shares as weights when aggregating tariffs to the industry level. This can potentially cause a low weight to be attached to products that face high tariffs, since those goods are likely to have low imports for reasons stated above. Lee and Swagel (1995) construct average tariffs using import shares and production shares as weights. Production shares tend to overstate protection, much the same way that import shares understate them. Their results indicate that the correlation between the two measures is very high, in the order of 0.98.

Since I do not have detailed enough data to construct production share weights, I experimented with using the simple average of the tariff rates and re-ran the regressions

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[14] Trefler estimates a simultaneous equation Tobit model, with one equation having non-tariff barriers as the dependent variable and the other having import penetration. The explanatory variables used in the import penetration equation are measures of factor endowments, which are not available for the EU and for the period in question.

to determine whether the choice of weights had any impact on the results. As indicated in the second column of Tables 3-6 and 3-7, the EU-specification still has the highest R-squared. These results then suggest that the results are robust to the choice of a weighting scheme.

Industry vs. Trade Data

Now, since the industry data for the period before 1995 required correction, as it referred to firms employing 20 or more persons while the trade data were for all firms, it is possible that these results might be subject to measurement error. To investigate this, the same regressions were ran, only now restricting the sample to 1995-99, the period for which data on all firms is available. The results are shown in the third column of Tables 3-6 and 3-7. In both cases, the EU-specification still has the best fit, indicating that the results have not been biased by the measurement error.

Functional Form

As discussed previously, I performed J- and P_E-specification tests to determine the appropriate functional form for the analysis. To ensure that the choice of functional form has no impact on the results, I experimented with using a linear specification (shown in the fourth column of Tables 3-6 and 3-7) and with a lin-log specification (column 5). The results indicate that choice of functional form does not alter the results, as the EU-specification still had the highest R-squared in both cases.

Time Fixed Effects

Another possible concern that might arise regards the use of a Uruguay Round dummy instead of time fixed-effects. To investigate whether this choice affected the results obtained, I re-ran all regressions, only this time including time dummies in place of the Uruguay Round dummy. As shown on the last column of Tables 3-6 and 3-7, this choice had no impact on the results, as the EU-specification performed slightly better than any of the decisive country models.

Finding the Decisive Country

So far, the method of selecting the decisive country's characteristics consisted of ranking each variable by industry and year, and picking the value that lied at the relevant percentile. However, if one were to count the number of times that a country's industry characteristics matched the appropriate percentile in the distribution and do it for every industry characteristic, one would most likely be unable to find a decisive country. Imagine, for example, a situation where France was the decisive country (at, for instance, the 80th percentile) in the number of firms and the share of employment, Germany was decisive in labor intensity and import penetration, Belgium was decisive in the change in import penetration and export intensity, and Italy was decisive in the capital-labor ratio and intra-industry trade. This, then, causes an inconsistent result, in that there are now four potential decisive countries. To circumvent this problem and as a further robustness check for the results, I experiment with two different methods for selecting the decisive country's characteristics, which I have labeled the "bivariate method" and the "preferred tariff method."

Bivariate Method

For the bivariate method, I regress the tariff rates against each of the industry characteristics, along with a set of industry fixed effects, to determine which of the industry characteristics were the most influential in affecting tariffs.

The results are shown in Tables 3-8 and 3-9. In both cases, the number of firms had the greatest explanatory power for all but the highest percentile model, in which case the import penetration had the highest R-squared. All of these variables had the predicted sign. For the purposes of this exercise, then, the variable providing the best fit for each model is used to determine the decisive country. In other words, in the case of the median specification, the country whose number of firms share lies at the median is the decisive country, regardless of whether any of its other industry characteristics also lie at the median. Using the data for the country that was decisive for each industry-year pair, I

then re-estimated the voting models. For comparison, I also provide the results from the EU-specification, which are the same as before since it does not involve a decisive country. The results, presented in Tables 3-10 and 3-11, show that the EU-specification still performs best.

Preferred Tariff Method

An alternative method to finding the decisive country involves using each country's tariff rates from before a common tariff was established—in this case, from 1958—to predict what their tariffs would have been had they not joined the EU; in other words, their preferred tariff rates are determined.

Tariffs for 1958 were taken from *Tariffs and Trade in Western Europe,* a report prepared by the Political and Economic Planning (PEP) organization in 1959 whose purpose was to present basic information needed to examine the European Community's integration process. The data is presented for 8 EC countries—Denmark, the UK, Germany, Belgium, Luxembourg, Netherlands, France and Italy, as well as Austria and Sweden, which became members in 1995. The tariffs needed to be converted from the BTN into the 3-digit NACE. Since no correspondence between the two classifications was available, I used the correspondence between Nimexe and NACE, available from Jon Haveman's Trade Concordance website, since the Nimexe matches the BTN at the 4-digit level exactly. Nimexe is a 6-digit classification used for trade data until 1987, and to find the correspondence between more disaggregated levels of the BTN and Nimexe, I examined their descriptions. The sample includes data for 100 industries and 5 countries (France, Germany, Italy, Netherlands and Belux, or Belgium and Luxembourg combined).

The first step is to estimate the relationship between the 1958 tariffs for each country and sector, and the industry characteristics. Since comparable industry data are not available for 1958, 1976 data are used instead. Here it is assumed that the function determining each country's preferred tariff does not change, so using 1976 data should

not have an impact. Results are shown in Table 3-12. The share of employment, the number of firms and the change in import penetration are significant, with the share of employment still exhibiting a negative, rather than the expected positive sign.

The second step is to use these estimates to predict each country's preferred tariff rate based on the 1987-99 industry data. With these results, I can then order countries on the basis of their tariff preference, from the country having the lowest preferred tariff to the country with the highest preferred tariff. Once I determine the preference ordering, I can then find the decisive country for each voting rule, so that, for instance, if the voting rule is simple majority, the decisive country is the one whose preferred tariff rate lies at the median. The last step is then to use the data for the decisive country, as determined through their policy preferences, to re-estimate the decisive country voting models and compare the results to the EU-wide model. The results are shown in Tables 3-13 and 3-14, and once again, they indicate that the EU-specification performs the best. These results then provide strong evidence that the EU has indeed become more like a single country in setting the common tariff in the post-SEA period.

Conclusion

This paper sought to empirically test the hypothesis that since 1987, as a result of more rapid integration, the EU has become more like a single unified country. In particular, it used existing political-economy models to present a framework for examining how tariffs are set in the European Union. If the EU is behaving like a group of countries, this procedure consisted of regressing the political-economy variables of the decisive country under each voting rule against the tariff rate. These voting rules included the median (to reflect majority voting); the 71^{st} percentile (to reflect the qualified majority voting rule used in the EU); the lowest and the highest point in the distribution (to reflect unanimity); and the 60^{th} and 80^{th} percentiles, to reflect some logrolling outcomes. The decisive country was the one whose industry characteristics lay at the relevant percentile. Two specifications were used: unweighted independent variables, and

weighted by the share of votes a country has in the Council of Ministers. These decisive country models were compared to one reflecting pan-European lobbying, which would be the result of increased integration. In this case, each country's industry characteristics are aggregated to the EU level.

Empirical results confirm anecdotal evidence suggesting an increased drift to Brussels, as the EU-specification performed better than any of the decisive country voting models. The data also implied that changes in the European common tariff during the 1987-99 period were best explained by the number of firms, the wage rate, the labor cost share and the import penetration. These results were robust to eliminating potentially endogenous variables, to using simple averages rather than import-weighted tariffs, restricting the sample period, changing the functional form and including time fixed-effects instead of a Uruguay Round dummy. The results were also robust to employing two different methods to find the decisive country. In both cases, I found the decisive country for each industry-year and each voting rule, and then re-estimated the models. Again, results confirmed the hypothesis that the EU is acting as a country rather than as a group of countries in setting the common tariff.

Table 3-1—Variable Sources and Definitions

	Definition	Source	Years
Tariff (%)	individual ad valorem tariffs common customs tariff ad valorem, conventional duties	*Tariffs and Trade in Western Europe* *Official Journal of the European Communities,* various years	1958 1987-99
Employment share	employment in sector *i* divided by the total number of employees in the country	Structural Business Statistics, NewCronos database	1987-99
# Firms	number of enterprises	Structural Business Statistics, NewCronos database	1987-99
Wage	wages divided by employment, in 1999 euros	Structural Business Statistics, NewCronos database	1987-99
Labor cost share	labor costs divided by the value of production	Structural Business Statistics, NewCronos database	1987-99
Intra-industry Trade	Grubel-Lloyd index of intra-industry trade, defined as one minus (absolute value of exports minus imports divided by exports plus imports)	Eurostat's EEC External Trade (Nimexe) 1976-87 Supplement 2 and Intra- and Extra-EU trade (Combined Nomenclature), Supplement 2	1987-99
Import penetration (%)	value of imports divided by apparent consumption (production value plus value of imports minus value of exports), times 100	Eurostat's EEC External Trade (Nimexe) 1976-87 Supplement 2 and Intra- and Extra-EU trade (Combined Nomenclature), Supplement 2	1987-99
Δ Import penetration (%)	import penetration in year *t* minus import penetration in year *t-1*	Eurostat's EEC External Trade (Nimexe) 1976-87 Supplement 2 and Intra- and Extra-EU trade (Combined Nomenclature), Supplement 2	1987-99
Export share	value of exports divided by the value of production	Eurostat's EEC External Trade (Nimexe) 1976-87 Supplement 2 and Intra- and Extra-EU trade (Combined Nomenclature), Supplement 2	1987-99

Table 3-2—Distribution of Votes in Council of Ministers

Country	Number of Votes
Austria, Sweden	4
Belgium, Netherlands	5
Denmark, Ireland, Finland	3
France, Germany, Italy	10
Greece, Portugal	5
Luxembourg	2
Spain	8
UK	10

Source: European Communties (1999).

Table 3-3—Summary Statistics

	Mean	Std Dev	Min	Median	60th Pctile	70th Pctile	80th Pctile	Max	# of Obs.
Tariff (%)	4.741	5.797	0	4.2	4.9	5.930	6.910	64.141	8084
Employment share (%)	1.165	1.298	0.003	0.694	0.936	1.290	1.856	10.087	6373
# Firms	682.99	2453.1	1	133	209	331	648	47944	6373
Wage (1000 euro/worker)	23.811	9.647	0.586	23.374	25.342	27.546	30.123	293.82	6373
Labor Cost Share (%)	23.694	9.125	1.200	23.723	26.071	28.123	30.858	78.594	6373
Intra-industry Trade (%)	56.363	27.478	0	58.812	67.383	75.837	84.135	100	6373
Import Penetration (%)	20.148	22.541	0	11.225	16.698	25.209	35.687	99.836	6373
Δ Import Penetration (%)	0.951	6.444	-72.11	0.217	0.729	1.598	2.991	69.846	6373
Export Share (%)	18.021	18.354	0	12.565	16.078	21.123	28.263	99.379	6373

Note: The share of employment, labor intensity, intra-industry trade index and the export share are scaled to percentage terms. See Table 3-1 for sources.

Table 3-4—Unweighted Regressions Testing Voting Models

Independent Variables are Unweighted
Dependent Variable: ln(1+import-weighted common tariff)

	EU as Group of Countries						EU as Single Country
	Lowest	Median	60th Pctile	QMV	80th Pctile	Highest	EU-Wide
Employment share	0.071	-0.121	0.013	-0.074	0.045	-0.129	-0.058
	(0.033)*	(0.069)*	(0.062)	(0.060)	(0.059)	(0.061)*	(0.143)
# Firms	-0.133	-0.177	-0.162	-0.138	-0.208	-0.139	-0.296
	(0.022)**	(0.039)**	(0.034)**	(0.023)**	(0.028)**	(0.035)**	(0.040)**
Wage	0.027	-0.436	-0.479	-0.137	-0.404	0.120	-0.607
	(0.064)	(0.159)**	(0.150)**	(0.147)	(0.111)**	(0.062)*	(0.140)**
Labor cost share	-0.072	-0.135	-0.033	-0.225	-0.294	-0.180	-0.388
	(0.073)	(0.117)	(0.126)	(0.144)	(0.136)*	(0.105)*	(0.190)*
Intra-industry	-0.319	-0.669	-0.490	-0.368	-0.176	-0.004	-0.319
	(0.183)*	(0.227)**	(0.215)*	(0.214)*	(0.174)	(0.214)	(0.199)
Import penetration	-0.085	-0.231	-0.241	-0.247	-0.239	-0.232	-0.207
	(0.037)**	(0.085)**	(0.070)**	(0.067)**	(0.062)**	(0.047)**	(0.083)**
Δ Imp. penetration	0.004	0.001	-0.002	0.004	0.002	0.002	0.001
	(0.003)	(0.005)	(0.005)	(0.004)	(0.003)	(0.002)	(0.004)
Export share	-0.083	-1.140	-0.322	-0.809	-0.880	-0.811	-0.724
	(0.180)	(0.429)**	(0.274)	(0.314)**	(0.392)*	(0.404)*	(0.612)
Uruguay round	-0.128	-0.148	-0.143	-0.122	-0.100	-0.151	-0.016
	(0.033)**	(0.036)**	(0.041)**	(0.034)**	(0.033)**	(0.034)**	(0.033)
Obs	658	658	658	658	658	658	658
R-squared (within)	0.2371	0.2646	0.2702	0.2553	0.3092	0.2502	0.3237
F-statistic	19.17	22.19	22.83	21.14	27.60	20.58	29.52

Sources: See Table 3-1.

Note: Panel regressions were run for 94 industries over 7 years (every other year from 1987-1999). Heteroskedasticity-consistent standard errors are in parenthesis. Estimates marked ** are significant at the 1-percent level; those marked * are significant at the 5-percent level. All variables are in logs, except for change in import penetration and the Uruguay round dummy (equal to 1 starting in 1993). The estimated equations also include a full set of industry dummies, which are not included in the calculation of the R-squared and the F-statistic, as well as a constant. Each column consists of one regression, with the headings indicating the voting model. Lowest and highest refer to the models testing unanimity; median tests the median-voter model; QMV tests the qualified-majority voting requirement (equivalent to the 71st percentile); and the 60th and 80th percentiles refer to the logrolling models. The EU-wide regression tests the hypothesis that the EU is acting as a country when setting tariffs.

Table 3-5—Weighted Regressions Testing Voting Models

Independent Variables are Weighted by Votes in Council of Ministers
Dependent Variable: ln(1 + import-weighted common tariff)

	EU as Group of Countries						EU as Single Country
	Lowest	Median	60th Pctile	QMV	80th Pctile	Highest	EU-Wide
Employment share	0.071	-0.136	-0.038	-0.041	-0.041	-0.129	-0.058
	(0.033)*	(0.096)	(0.061)	(0.066)	(0.073)	(0.061)*	(0.143)
# Firms	-0.133	-0.197	-0.188	-0.236	-0.146	-0.139	-0.296
	(0.022)**	(0.030)**	(0.037)**	(0.045)**	(0.037)**	(0.035)**	(0.040)**
Wage	0.027	-0.489	-0.295	0.023	0.117	0.120	-0.607
	(0.064)	(0.172)**	(0.186)	(0.145)	(0.118)	(0.062)*	(0.140)**
Labor cost share	-0.072	0.156	0.004	0.240	-0.171	-0.180	-0.388
	(0.073)	(0.118)	(0.128)	(0.120)*	(0.179)	(0.105)*	(0.190)*
Intra-industry	-0.319	-0.255	-0.619	-0.332	-0.565	-0.004	-0.319
	(0.183)*	(0.226)	(0.257)**	(0.220)	(0.233)**	(0.214)	(0.199)
Import penetration	-0.085	-0.213	-0.211	-0.180	-0.251	-0.232	-0.207
	(0.037)**	(0.078)**	(0.074)**	(0.093)*	(0.067)**	(0.047)**	(0.083)**
Δ Imp. penetration	0.004	0.001	0.004	0.004	0.006	0.002	0.001
	(0.003)	(0.004)	(0.004)	(0.004)	(0.003)	(0.002)	(0.004)
Export share	-0.083	-1.142	-1.041	-0.993	-1.087	-0.811	-0.724
	(0.180)	(0.545)*	(0.370)**	(0.352)**	(0.486)*	(0.404)*	(0.612)
Uruguay round	-0.128	-0.128	-0.148	-0.125	-0.094	-0.151	-0.016
	(0.033)**	(0.034)**	(0.037)**	(0.038)**	(0.036)**	(0.034)**	(0.033)
Obs	658	658	658	658	658	658	658
R-squared (within)	0.2371	0.2943	0.2634	0.2604	0.2554	0.2502	0.3237
F-statistic	19.17	25.71	22.05	21.71	21.15	20.58	29.52

Sources: See Table 3-1.

Note: Panel regressions were run for 94 industries over 7 years (every other year from 1987-1999). Heteroskedasticity-consistent standard errors are in parenthesis. Estimates marked ** are significant at the 1-percent level; those marked * are significant at the 5-percent level. All variables are in logs, except for change in import penetration and the Uruguay round dummy (equal to 1 starting in 1993). The estimated equations also include a full set of industry dummies, which are not included in the calculation of the R-squared and the F-statistic, as well as a constant. Each column consists of one regression, with the headings indicating the voting model. Lowest and highest refer to the models testing unanimity; median tests the median-voter model; QMV tests the qualified-majority requirement (equivalent to the 71st percentile); and the 60th and 80th percentiles refer to the logrolling models. The EU-wide regression tests the hypothesis that the EU is acting as a country when setting tariffs.

Table 3-6—Sensitivity Analysis, Unweighted Specification

	Import Pen.	Tariff weight	95-99	Linear	Lin-Log	Time FE's
Lowest	0.2268	0.2813	0.1915	0.3161	0.0932	0.3801
Median	0.2462	0.2735	0.2512	0.1897	0.1039	0.3812
60th Pctile	0.2455	0.2969	0.3077	0.2290	0.0963	0.3715
QMV	0.2280	0.2683	0.1832	0.2597	0.0975	0.3817
80th Pctile	0.2816	0.2881	0.2626	0.3732	0.1410	0.3908
Highest	0.2140	0.2464	0.2300	0.2496	0.1052	0.3856
EU-wide	0.3154	0.3568	0.3130	0.3803	0.1436	0.3930
Obs.	658	658	282	658	658	658

Note: Columns refer to different sensitivity tests, while each row corresponds to a voting model. Each cell refers to the within R-squared for a particular model and specification. The sensitivity tests are as follows: *import pen.* refers to a specification without the import penetration and the change in import penetration, which are potentially endogenous; *tariff weight* refers to employing the simple average, rather than the import-weighted common tariff; *95-99* indicates that the sample was constrained to the 1995-99 period; *linear* and *lin-log* denote a specification in which none of the variables are in logs and one in which only the independent variables are in logs, respectively; and *time FE's* indicates that time fixed effects were included instead of a Uruguay round dummy.

Table 3-7—Sensitivity Analysis, Weighted Specification

	Import Pen.	Tariff weight	95-99	Linear	Lin-Log	Time FE's
Lowest	0.2268	0.2813	0.1915	0.3161	0.0932	0.3801
Median	0.28812	0.3335	0.2533	0.1871	0.1205	0.3718
60th Pctile	0.2472	0.3128	0.2660	0.1638	0.1026	0.3712
QMV	0.2506	0.2825	0.2301	0.2519	0.1036	0.3724
80th Pctile	0.2282	0.2671	0.2270	0.2796	0.1166	0.3909
Highest	0.2140	0.2464	0.2300	0.2496	0.1052	0.3856
EU-wide	0.3154	0.3568	0.3130	0.3803	0.1436	0.3930
Obs.	658	658	282	658	658	658

Note: Columns refer to different sensitivity tests, while each row corresponds to a voting model. Each cell refers to the within R-squared for a particular model and specification. The sensitivity tests are as follows: *import pen.* refers to a specification without the import penetration and the change in import penetration, which are potentially endogenous; *tariff weight* refers to employing the simple average, rather than the import-weighted common tariff; *95-99* indicates that the sample was constrained to the 1995-99 period; *linear* and *lin-log* denote a specification in which none of the variables are in logs and one in which only the independent variables are in logs, respectively; and *time FE's* indicates that time fixed effects were included instead of a Uruguay round dummy.

Table 3-8—Unweighted Bivariate Regressions Identifying Variable that Best Explains Tariffs for Each Voting Rule

	Independent Variables are Unweighted Dependent Variable: ln(1+import-weighted common tariff)					
	Lowest	Median	60th Pctile	QMV	80th Pctile	Highest
Employment share	0.150	0.001	0.142	0.051	0.218	-0.246
	(0.029)**	(0.069)	(0.068)*	(0.069)	(0.064)**	(0.066)**
R-squared (within)	0.0319	0.0000	0.0053	0.0007	0.0161	0.0229
# Firms	-0.218	-0.277	-0.263	-0.219	-0.236	-0.212
	(0.017)**	(0.037)**	(0.027)**	(0.022)**	(0.023)**	(0.041)**
R-squared (within)	0.1865	0.1181	0.1754	0.1641	0.2281	0.0510
Wage	0.155	0.401	0.198	0.878	0.601	0.475
	(0.063)**	(0.139)**	-0.131	(0.127)**	(0.113)**	(0.073)**
R-squared (within)	0.0045	0.0087	0.0024	0.0655	0.0409	0.1070
Labor cost share	0.242	0.247	0.541	-0.020	0.103	-0.29
	(0.068)**	(0.121)*	(0.140)**	(0.160)	-0.157	(0.124)**
R-squared (within)	0.0207	0.0039	0.0184	0.0000	0.0011	0.0107
Intra-industry	-0.848	-1.333	-1.322	-0.951	-0.967	-0.182
	(0.225)**	(0.240)**	(0.227)**	(0.227)**	(0.188)**	-0.262
R-squared (within)	0.0186	0.0419	0.0447	0.0235	0.0343	0.0010
Import penetration	-0.156	-0.432	-0.425	-0.412	-0.340	-0.359
	(0.042)**	(0.064)**	(0.061)**	(0.061)**	(0.060)**	(0.040)**
R-squared (within)	0.0147	0.0939	0.0945	0.1013	0.0679	0.1177
Δ Import penetration	0.009	-0.024	-0.025	-0.022	-0.013	-0.008
	(0.003)**	(0.007)**	(0.006)**	(0.005)**	(0.003)**	(0.002)**
R-squared (within)	0.0371	0.0151	0.0205	0.0232	0.0168	0.0339
Export share	-0.991	-2.882	-2.515	-2.868	-3.165	-2.228
	(0.140)**	(0.393)**	(0.317)**	(0.346)**	(0.425)**	(0.488)**
R-squared (within)	0.0658	0.1056	0.0815	0.0852	0.0866	0.0350
Observations	658	658	658	658	658	658

Sources: See Table 3-1.

Note: Each table cell represents one regression, with the coefficient, heteroskedasticity-consistent standard errors in parenthesis underneath and the within R-squared. Rows indicate the independent variable that is regressed against the tariff rate, while each column represents a voting rule. Lowest and highest refer to the models testing unanimity; median tests the median-voter model; QMV tests the qualified-majority voting requirement (equivalent to the 71st percentile); and the 60th and 80th percentiles refer to the logrolling models. Estimates marked ** are significant at the 1-percent level; those marked * are significant at the 5-percent level. All variables are in logs, except for change in import penetration. The estimated equations also include a full set of industry dummies, which are not included in the calculation of the R-squared, as well as a constant.

Table 3-9—Weighted Bivariate Regressions Identifying Variable that Best Explains Tariffs for Each Voting Rule

Independent Variables are Weighted by Votes in Council of Ministers Dependent Variable: ln(1+import-weighted common tariff)						
	Lowest	Median	60th Pctile	QMV	80th Pctile	Highest
Employment share	0.150	0.044	-0.025	0.034	0.014	-0.246
	(0.029)**	(0.099)	(0.067)	(0.081)	(0.072)	(0.066)**
R-squared (within)	0.0319	0.0005	0.0002	0.0002	0.0000	0.0229
# Firms	-0.218	-0.279	-0.278	-0.348	-0.262	-0.212
	(0.017)**	(0.029)**	(0.034)**	(0.038)**	(0.029)**	(0.041)**
R-squared (within)	0.1865	0.1983	0.1422	0.1650	0.1539	0.0510
Wage	0.155	0.476	0.646	0.857	0.836	0.475
	(0.063)**	(0.145)**	(0.155)**	(0.096)**	(0.095)**	(0.073)**
R-squared (within)	0.0045	0.0127	0.0294	0.1035	0.1215	0.1070
Labor cost share	0.242	0.651	0.568	0.623	0.029	-0.29
	(0.068)**	(0.122)**	(0.129)**	(0.125)**	(0.191)	(0.124)**
R-squared (within)	0.0207	0.0298	0.0205	0.0247	0.0001	0.0107
Intra-industry	-0.848	-1.081	-1.502	-0.856	-1.235	-0.182
	(0.225)**	(0.232)**	(0.254)**	(0.237)**	(0.255)**	-0.262
R-squared (within)	0.0186	0.0278	0.0471	0.0160	0.0377	0.0010
Import penetration	-0.156	-0.498	-0.425	-0.452	-0.424	-0.359
	(0.042)**	(0.063)**	(0.058)**	(0.068)**	(0.061)**	(0.040)**
R-squared (within)	0.0147	0.1149	0.0959	0.0965	0.1040	0.1177
Δ Import penetration	0.009	-0.020	-0.019	-0.019	-0.015	-0.008
	(0.003)**	(0.007)**	(0.006)**	(0.005)**	(0.004)**	(0.002)**
R-squared (within)	0.0371	0.0115	0.0135	0.0158	0.0166	0.0339
Export share	-0.991	-3.102	-2.888	-2.567	-3.235	-2.228
	(0.140)**	(0.439)**	(0.396)**	(0.428)**	(0.522)**	(0.488)**
R-squared (within)	0.0658	0.0808	0.0763	0.0531	0.0696	0.0350
Observations	658	658	658	658	658	658

Sources: See Table 3-1.

Note: Each table cell represents one regression, with the coefficient, heteroskedasticity-consistent standard errors in parenthesis underneath and the within R-squared. Rows indicate the independent variable that is regressed against the tariff rate, while each column represents a voting rule. Lowest and highest refer to the models testing unanimity; median tests the median-voter model; QMV tests the qualified-majority requirement (equivalent to the 71st percentile); and the 60th and 80th percentiles refer to the logrolling models. Estimates marked ** are significant at the 1-percent level; those marked * are significant at the 5-percent level. All variables are in logs, except for change in import penetration. The estimated equations also include a full set of industry dummies, which are not included in the calculation of the R-squared, as well as a constant.

Table 3-10—Unweighted Regressions Using Characteristics of Country Whose Main Explanatory Variable Lies at Indicated Percentile (Bivariate Regression Method)

Independent Variables are Unweighted Dependent Variable: ln(1+import-weighted common tariff)							
	EU as Group of Countries						EU as Single Country
	Lowest	Median	60th Pctile	QMV	80th Pctile	Highest	EU-Wide
Employment share	-0.059	-0.017	0.050	0.022	-0.068	0.032	-0.058
	(0.046)	(0.030)	(0.023)*	(0.028)	(0.023)**	(0.034)	(0.143)
# Firms	-0.163	-0.172	-0.192	-0.135	-0.195	-0.035	-0.296
	(0.026)**	(0.039)**	(0.031)**	(0.022)**	(0.027)**	(0.015)**	(0.040)**
Wage	-0.214	-0.108	0.008	-0.077	-0.008	0.064	-0.607
	(0.090)**	(0.052)*	(0.032)	(0.036)*	(0.046)	(0.043)	(0.140)**
Labor cost share	0.018	-0.151	-0.111	-0.163	-0.035	0.090	-0.388
	(0.076)	(0.072)*	(0.064)*	(0.059)**	(0.051)	(0.059)	(0.190)*
Intra-industry	0.034	0.042	0.137	-0.103	0.135	-0.063	-0.319
	(0.136)	(0.104)	(0.114)	(0.109)	(0.106)	(0.145)	(0.199)
Import penetration	-0.062	-0.055	0.010	-0.074	-0.173	-0.244	-0.207
	(0.041)	(0.026)*	(0.030)	(0.027)**	(0.032)**	(0.051)**	(0.083)**
Δ Imp. penetration	-0.004	-0.00007	-0.0001	0.004	0.006	0.003	0.001
	(0.002)*	(0.001)	(0.002)	(0.003)	(0.002)*	(0.002)	(0.004)
Export share	0.231	-0.642	-0.129	0.276	-0.137	-0.031	-0.724
	(0.357)	(0.189)**	(0.161)	(0.165)*	(0.119)	(0.171)	(0.612)
Uruguay round	-0.166	-0.163	-0.152	-0.173	-0.111	-0.189	-0.016
	(0.035)**	(0.025)**	(0.028)**	(0.028)**	(0.026)**	(0.030)**	(0.033)
Obs	658	658	658	658	658	658	658
R-squared (within)	0.2349	0.2708	0.2394	0.2536	0.3147	0.2261	0.3237
F-statistic	18.93	22.90	19.41	20.95	28.32	18.02	29.52

Sources: See Table 3-1.

Note: Panel regressions were run for 94 industries over 7 years (every other year from 1987-1999). Heteroskedasticity-consistent standard errors are in parenthesis. Estimates marked ** are significant at the 1-percent level; those marked * are significant at the 5-percent level. All variables are in logs, except for change in import penetration and the Uruguay round dummy (equal to 1 starting in 1993). The estimated equations also include a full set of industry dummies, which are not included in the calculation of the R-squared and the F-statistic, as well as a constant. Each column consists of one regression, with the headings indicating the voting model. Lowest and highest refer to the models testing unanimity; median tests the median-voter model; QMV tests the qualified-majority requirement (equivalent to the 71st percentile); and the 60th and 80th percentiles refer to the logrolling models. Regressions are based on data for the country whose most influential characteristic, as determined in Table 3-8, lies at the relevant percentile. The EU-wide regression tests the hypothesis that the EU is acting as a country when setting tariffs.

Table 3-11—Weighted Regressions Using Characteristics of Country whose Main Explanatory Variable Lies at Indicated Percentile (Bivariate Regression Method)

Independent Variables are Weighted by Votes in Council of Ministers
Dependent Variable: ln(1 + import-weighted common tariff)

	EU as Group of Countries						EU as Single Country
	Lowest	Median	60th Pctile	QMV	80th Pctile	Highest	EU-Wide
Employment share	-0.059	-0.028	-0.035	-0.014	0.040	0.031	-0.058
	(0.045)	(0.041)	(0.032)	(0.029)	(0.029)	(0.034)	(0.143)
# Firms	-0.163	-0.221	-0.167	-0.248	-0.170	-0.033	-0.296
	(0.026)**	(0.031)**	(0.033)**	(0.045)**	(0.034)**	(0.015)*	(0.040)**
Wage	-0.214	-0.138	0.056	-0.152	0.021	0.063	-0.607
	(0.090)**	(0.069)*	(0.054)	(0.053)**	(0.039)	(0.043)	(0.140)**
Labor cost share	0.018	-0.034	-0.329	-0.063	-0.214	0.085	-0.388
	(0.076)	(0.085)	(0.108)**	(0.070)	(0.067)**	(0.059)	(0.190)*
Intra-industry	0.035	0.093	-0.098	0.121	0.011	-0.064	-0.319
	(0.136)	(0.110)	(0.095)	(0.122)	(0.114)	(0.145)	(0.199)
Import penetration	-0.064	-0.097	-0.100	-0.062	-0.022	-0.245	-0.207
	(0.041)	(0.047)*	(0.036)**	(0.033)*	(0.035)	(0.051)**	(0.083)**
Δ Imp. penetration	-0.004	0.003	0.001	-0.001	0.002	0.003	0.001
	(0.002)*	(0.002)*	(0.001)	(0.002)	(0.003)	(0.002)	(0.004)
Export share	0.213	-0.372	0.004	-0.392	-0.004	-0.032	-0.724
	(0.355)	(0.188)*	(0.182)	(0.214)*	(0.210)	(0.171)	(0.612)
Uruguay round	-0.165	-0.151	-0.201	-0.153	-0.170	-0.189	-0.016
	(0.035)**	(0.026)**	(0.027)**	(0.027)**	(0.029)**	(0.030)**	(0.033)
Obs	658	658	658	658	658	658	658
R-squared (within)	0.2351	0.2818	0.2596	0.2768	0.2398	0.2249	0.3237
F-statistic	18.95	24.20	21.62	23.60	19.45	17.89	29.52

Sources: See Table 3-1.

Note: Panel regressions were run for 94 industries over 7 years (every other year from 1987-1999). Heteroskedasticity-consistent standard errors are in parenthesis. Estimates marked ** are significant at the 1-percent level; those marked * are significant at the 5-percent level. All variables are in logs, except for change in import penetration and the Uruguay round dummy (equal to 1 starting in 1993). The estimated equations also include a full set of industry dummies, which are not included in the calculation of the R-squared and the F-statistic, as well as a constant. Each column consists of one regression, with the headings indicating the voting model. Lowest and highest refer to the models testing unanimity; median tests the median-voter model; QMV tests the qualified-majority voting requirement (equivalent to the 71st percentile); and the 60th and 80th percentiles refer to the logrolling models. Regressions are based on data for the country whose most influential characteristic, as determined in Table 3-9, lies at the relevant percentile. The EU-wide regression tests the hypothesis that the EU is acting as a country when setting tariffs.

Table 3-12—Regression on 1958 Country-Specific Tariffs

Dependent Variable: Import Weighted Tariff	
Employment share	-2.308
	(0.814)**
# Firms	0.997
	(0.384)**
Wage	-0.424
	(0.498)
Labor cost share	0.100
	(0.839)
Intra-industry	-2.539
	(3.161)
Import penetration	-1.224
	(0.873)
Δ Import penetration	0.139
	(0.071)*
Export share	-6.770
	(12.304)
Obs	403
R-squared (within)	0.0827
F-statistic	3.33

Sources: See Table 3-1.

Note: Panel regressions were run for 5 countries (Belgium and Luxembourg, France, Germany, Italy and the Netherlands) and 100 industries. Not all country-industry pairs had a tariff rate available. Industry and trade data are from 1976. Heteroskedasticity-consistent standard errors are in parenthesis. Estimates marked ** are significant at the 1-percent level; those marked * are significant at the 5-percent level. All variables are in logs, with the exception of the change in import penetration. The estimated equations also include a full set of industry dummies, which are not included in the calculation of the R-squared and the F-statistic, as well as a constant. The change in import penetration refers to the change from 1976 to 1977.

Table 3-13—Unweighted Regressions Using Characteristics of Country Whose Preferred Tariff Rate Lies at Indicated Percentile (Preferred Tariff Method)

Independent Variables are Unweighted Dependent Variable: ln(1+import-weighted common tariff)							
	EU as Group of Countries						EU as Single Country
	Lowest	Median	60th Pctile	QMV	80th Pctile	Highest	EU-Wide
Employment share	-0.154	-0.004	0.123	0.142	0.056	0.197	-0.058
	(0.038)**	(0.057)	(0.049)**	(0.047)**	(0.053)	(0.048)**	(0.143)
# Firms	-0.019	-0.021	-0.090	-0.115	-0.096	-0.140	-0.296
	(0.022)	(0.035)	(0.025)**	(0.020)**	(0.024)**	(0.022)**	(0.040)**
Wage	0.094	-0.031	-0.048	0.024	0.105	-0.010	-0.607
	(0.070)	(0.074)	(0.074)	(0.034)	(0.050)*	(0.039)	(0.140)**
Labor cost share	0.110	0.001	-0.041	-0.048	0.074	-0.023	-0.388
	(0.059)*	(0.058)	(0.064)	(0.048)	(0.066)	(0.051)	(0.190)*
Intra-industry	-0.179	-0.137	0.172	0.046	0.073	0.026	-0.319
	(0.121)	(0.103)	(0.095)*	(0.111)	(0.095)	(0.091)	(0.199)
Import penetration	-0.132	-0.077	0.016	-0.021	-0.018	-0.010	-0.207
	(0.049)**	(0.034)*	(0.030)	(0.030)	(0.031)	(0.039)	(0.083)**
Δ Imp. penetration	0.003	0.001	-0.004	-0.003	-0.012	-0.003	0.001
	(0.002)	(0.003)	(0.003)*	(0.002)	(0.003)**	(0.003)	(0.004)
Export share	-0.263	0.161	0.152	0.223	0.043	0.278	-0.724
	(0.173)	(0.227)	(0.205)	(0.195)	(0.222)	(0.207)	(0.612)
Uruguay round	-0.199	-0.267	-0.252	-0.216	-0.206	-0.182	-0.016
	(0.028)**	(0.028)**	(0.030)**	(0.026)**	(0.029)**	(0.029)**	(0.033)
Obs	658	658	658	658	658	658	658
R-squared (within)	0.2417	0.1848	0.1912	0.2229	0.2263	0.2294	0.3237
F-statistic	19.65	13.98	14.58	17.69	18.03	18.36	29.52

Sources: See Table 3-1.

Note: Preferred tariff rates were predicted using the results from a regression of 1958 country-specific tariffs against 1976 industry and trade characteristics (see Table 3-12). Panel regressions were run for 94 industries over 7 years (every other year from 1987-1999). Heteroskedasticity-consistent standard errors are in parenthesis. Estimates marked ** are significant at the 1-percent level; those marked * are significant at the 5-percent level. All variables are in logs, except for change in import penetration and the Uruguay round dummy (equal to 1 starting in 1993). The estimated equations also include a full set of industry dummies, which are not included in the calculation of the R-squared and the F-statistic, as well as a constant. Each column consists of one regression, with the headings indicating the voting model. Lowest and highest refer to the models testing unanimity; median tests the median-voter model; QMV tests the qualified-majority voting requirement (equivalent to the 71st percentile); and the 60th and 80th percentiles refer to the logrolling models. The EU-wide regression tests the hypothesis that the EU is acting as a country when setting tariffs.

Table 3-14—Weighted Regressions Using Characteristics of Country Whose Preferred Tariff Rate Lies at Indicated Percentile (Preferred Tariff Method)

Independent Variables are Weighted by Votes in Council of Ministers
Dependent Variable: ln(1 + import-weighted common tariff)

	EU as Group of Countries						EU as Single Country
	Lowest	Median	60th Pctile	QMV	80th Pctile	Highest	EU-Wide
Employment share	-0.154	0.194	0.219	0.170	0.087	0.197	-0.058
	(0.038)**	(0.052)**	(0.058)**	(0.048)**	(0.062)	(0.048)**	(0.143)
# Firms	-0.019	-0.167	-0.160	-0.132	-0.127	-0.140	-0.296
	(0.022)	(0.025)**	(0.024)**	(0.021)**	(0.023)**	(0.022)**	(0.040)**
Wage	0.094	-0.022	0.059	0.095	0.062	-0.010	-0.607
	(0.070)	(0.048)	(0.047)	(0.063)	(0.055)	(0.039)	(0.140)**
Labor cost share	0.110	0.136	0.030	-0.114	0.079	-0.023	-0.388
	(0.059)*	(0.062)*	(0.070)	(0.073)	(0.069)	(0.051)	(0.190)*
Intra-industry	-0.179	-0.063	0.072	0.207	-0.025	0.026	-0.319
	(0.121)	(0.096)	(0.093)	(0.093)*	(0.101)	(0.091)	(0.199)
Import penetration	-0.132	-0.008	0.018	0.009	-0.090	-0.010	-0.207
	(0.049)**	(0.035)	(0.041)	(0.027)	(0.040)*	(0.039)	(0.083)**
Δ Imp. penetration	0.003	-0.006	-0.007	-0.003	-0.008	-0.003	0.001
	(0.002)	(0.002)**	(0.003)**	(0.002)	(0.003)**	(0.003)	(0.004)
Export share	-0.263	0.485	0.297	-0.182	0.079	0.278	-0.724
	(0.173)	(0.206)**	(0.245)	(0.211)	(0.204)	(0.207)	(0.612)
Uruguay round	-0.199	-0.181	-0.169	-0.181	-0.149	-0.182	-0.016
	(0.028)**	(0.029)**	(0.026)**	(0.030)**	(0.029)**	(0.029)**	(0.033)
Obs	658	658	658	658	658	658	658
R-squared (within)	0.2417	0.2526	0.2473	0.2402	0.2582	0.2294	0.3237
F-statistic	19.65	20.84	20.26	19.50	21.46	18.36	29.52

Sources: See Table 3-1.

Note: Preferred tariff rates were predicted using the results from a regression of 1958 country-specific tariffs against 1976 industry and trade characteristics (see Table 3-12). Panel regressions were run for 94 industries over 7 years (every other year from 1987-1999). Heteroskedasticity-consistent standard errors are in parenthesis. Estimates marked ** are significant at the 1-percent level; those marked * are significant at the 5-percent level. All variables are in logs, except for change in import penetration and the Uruguay round dummy (equal to 1 starting in 1993). The estimated equations also include a full set of industry dummies, which are not included in the calculation of the R-squared and the F-statistic, as well as a constant. Each column consists of one regression, with the headings indicating the voting model. Lowest and highest refer to the models testing unanimity; median tests the median-voter model; QMV tests the qualified-majority voting requirement (equivalent to the 71st percentile); and the 60th and 80th percentiles refer to the logrolling models. The EU-wide regression tests the hypothesis that the EU is acting as a country when setting tariffs.

CHAPTER 4
EXPLAINING CHANGES IN THE EUROPEAN UNION'S CUSTOMS CLASSIFICATION: NEW PRODUCTS OR POLITICAL ECONOMY?

Introduction

Customs classification is an important element in a country's trade policy. How a good is classified can affect the rate of duty that applies, the coverage of non-tariff barriers, and the formulation and application of rules of origin. The nomenclature can also impact multilateral agreements. Tariff reductions are negotiated on a range of products, and the decision as to whether the tariff on a particular good should be reduced depends on whether the good falls within the list. Whether the product belongs in the list in turn depends on the country's customs nomenclature.

Given the number of ways the customs classification can affect trade policy, and given how it is constantly altered, it seems reasonable that countries would choose to manipulate the classification for protectionist reasons. Changes in the tariff schedule, of course, can result from new products or technologies that make it necessary to readjust it in order to better reflect the set of products actually available in the market. But "tariff reshuffling" (Messerlin 2001) can also be used as a means of increasing the tariff on a particular good. One example is the classification of compact-disk players in the European Union's (EU) tariff schedule. Before 1983, they were classified as "record players," and were charged a duty of 9%. In 1984, a new tariff line was added to represent them, and the tariff rate was raised to 16.5% (Messerlin 2001). Tariff reclassification also played a role in the negotiations for the International Technology Agreement (ITA), causing a dispute between the EU and the U.S. In 1994 and 1995, the EU reclassified some electronic products normally regarded as computer devices into telecommunications and consumer electronics, which were higher tariff categories.

Initially, reclassified products included only some local area networking (LAN) equipment, but in 1996, the list was enlarged to include CD-ROM drives and some personal computers with multimedia capabilities. Indeed, the EU actually removed multimedia PCs, which were covered by the ITA, out of the computer category and reclassified them as televisions, which were not covered by the ITA (Fliess and Sauvé 1998).

It is evident, then, that these changes in the tariff schedule are extremely important in assessing the pattern of protection in a country. This is a topic, however, that has received little attention in the literature. In fact, to my knowledge, no study exists that examines these reclassifications and the motives behind them. This paper, then, seeks to fill that void by taking a first pass at explaining these changes, and exploring whether they arise out of political-economy considerations, as the anecdotal evidence seems to suggest, or merely from the introduction of new products into the market.

The EU seems ideally suited for this analysis. In 1987, a new classification system was adopted in an effort to harmonize the tariff and external trade statistics. Named the Combined Nomenclature (CN), it is an 8-digit classification based on the Harmonized System (HS),[1] matching it at the 6-digit level. Decisions on the nomenclature are made by the European Commission in concert with the Committee on Tariff and Statistical Nomenclature, also known as the "Nomenclature Committee," and, in cases where the committee disagrees with the Commission proposal, the Council of Ministers. The European Commission is made of 20 Commissioners appointed by the Member States and given 5-year terms. The president of the Commission is chosen by the governments after consultation with the European Parliament (European Communities 1999). In drafting proposals with regard to the nomenclature, the Commission is assisted by the "Nomenclature Committee," which is composed of representatives from the

[1] The Harmonized System is an international classification administered by the World Customs Organization (European Commission 1999).

Member States and chaired by representatives of the Commission. The Commission representative submits to the committee a draft of measures to be adopted, and the committee delivers its opinion, voting on the basis of qualified-majority,[2] with each Member State having the number of votes shown in Table 4-1. If the committee decides against the Commission's proposal, it passes on to the Council of Ministers, who will vote to adopt or reject the measure on the basis of qualified-majority (Council Regulation No. 2658/87). The Council of Ministers is made up of ministers from each member state, with different ministers participating in the Council meetings according to the subject under discussion—for instance, Agricultural Ministers discuss farm prices in the Agriculture Council and Economic and Finance Ministers discuss monetary affairs in the ECOFIN council (European Communities 1999). As with the Nomenclature Committee, each country has the number of votes shown in Table 4-1.

If changes to the CN are a result of lobbying pressure from protectionist interests, then industries with higher tariffs should experience an increase in the number of subheadings, while a decrease in the number of subheadings should be observed in industries with low tariffs as products are moved to higher tariff categories. If it is assumed that any changes result in greater protection for the industry involved, it becomes then possible to model the decision-making process in the same way as tariff determination. Of course, tariffs are not the sole instrument of protection and hence are not the only reason firms would lobby for a change in classification. For instance, in 1993, the EU imposed antidumping duties on microdisks originating in Japan, China, and Taiwan. The duties were imposed on blank 3.5-inch microdisks used to record and store encoded digital computer information. Some importers successfully lobbied for a different classification for pre-formatted microdisks so that they would be exempt from these duties. Other countries, however, disagreed with this classification, and the

[2] Qualified-majority requires about 71 percent of the votes in order for a measure to pass.

European Commission ultimately decided that the formatting of the disk was not to be considered as a recording on the media itself, so that the antidumping duties did in fact apply (Schueren 1997). Such non-tariff barriers, however, are difficult to measure, so it becomes necessary to proxy for protection using an industry's political-economy characteristics.

Determining whether lobbying for protection plays a role in how goods are classified in the CN requires specifying the decision-making process. Given how decisions are made, interest groups can have two potential channels of influence: their national governments or the European Commission. If firms wish to influence decisions in the Nomenclature Committee or the Council of Ministers, they might concentrate their efforts on their national governments, with member countries then bargaining at the committee or the Council to determine the new classification. If firms are lobbying the Commission instead, so as to affect policy at the agenda-setting stage, then each EU country would be behaving like a U.S. state, which must lobby Washington for protection, rather than lobbying its state capital. This means that the appropriate specification in this case would be one similar to the one used to explain U.S. tariffs. If changes in classification are assumed to be a function of various political-economy characteristics, this specification requires adding up, for instance, the number of firms in the textile industry in France with the number of firms in that industry in Germany and so forth.

To determine whether the EU's tariff classification reflects lobbying with the intent of increasing protection, I test this hypothesis against the alternative that how goods are classified is merely a result of new products or technologies. The variables used in this case include the number of total patent applications in the U.S. (which proxy for the introduction of new products), the number of firms in the industry and an intra-industry trade index, which measures the degree of product differentiation. To account for the different decision rules, I perform the same test for each possible voting rule. The

analysis uses a dataset containing 92 manufacturing industries covering the 1988-1999 period, which includes one official enlargement in 1995 and the unification of Germany in 1990, which could also be considered an enlargement. An advantage of using panel data in this case is that these enlargements provide for an additional source of variation. Because we do not observe how countries vote on changes in the classification, it becomes necessary to examine the issue empirically.

Results suggest that protectionist lobbying does indeed play a role in how goods are classified in the EU. These results are robust to various specifications.

The paper is divided as follows: the next section develops the framework for the analysis. The third section describes the estimation procedure, the data, and the predictions. The fourth section provides the empirical results, while the last section summarizes the paper.

Empirical Strategy

Measuring Changes in Classification

The first step in the analysis consists of defining how the dependent variable will be measured. Because most independent variables used are at a higher level of aggregation than tariff rates, so that there are different numbers of tariff lines making up one industry category, I chose to use the number of tariff lines in each industry. Admittedly, this is an indirect measure, since it would be best to construct a disaggregated measure that more accurately reflects whether the changes in classification actually resulted in a higher tariff. Tariff reshuffling, however, can also result in higher non-tariff barriers or a greater number of antidumping actions, so that looking at tariffs alone will not be an accurate reflection of the level of protection. An ideal measure, then, would take into account whether the change in tariff subheadings caused an increase in protection, however defined. Given the data limitations, this paper assumes that if a reclassification occurred because of political-economy considerations, then the reclassification must have had a protectionist intent. This implies that industries with

higher tariffs or higher overall protection should have more tariff lines than industries with lower protection. I use the number of tariff lines and the level of protection rather than the *change* because tariffs have been trending downwards as a result of the numerous trade rounds. Also, tariff reshuffling for protectionist purposes occur because another category has a higher level of protection, rather than because protection has increased for that good.

Political-Economy of Tariff Reshuffling

If changes in the EU's customs classification take place as a result of lobbying pressure and are used as a means of protecting an industry, then changes in classification can be regarded as a protectionist measure. This means that industries seeking protection will lobby for a reclassification into a higher tariff category or one that is subject to quotas or antidumping duties. In other words, if decisions on the tariff classification result from political-economy considerations, then the level of protection in an industry should be an explanatory variable.

The question then becomes how to measure the level of protection in an industry. One way is to use the tariff rate in that industry. Tariffs, however, are measured at the 8-digit CN level, while other covariates are measured at the 3-digit NACE Rev. 1 level, making it necessary to aggregate tariff rates to the industry level. If one calculates a simple average or an import-weighted average of all tariff rates making up one industry, it creates an endogeneity problem, since the tariff rate would become dependent on the number of tariff lines involved. To circumvent this problem, I only use the tariff rate for goods with the highest share of trade in an industry in calculating the duty for a particular industry. This method, which is described in more detail in section 3, substantially reduces the variation due to changes in the number of tariff lines.

Tariff rates, however, are not the only available instrument for protection. Non-tariff barriers (NTBs) such as quotas and VERs, as well as antidumping duties, are also used to protect an industry. Because it is difficult to accurately measure NTBs, I use an

industry's political-economy characteristics to proxy for the level of protection it receives. Anything that increases the level of protection an industry receives should also increase the number of tariff lines, as goods are moved to new categories to take advantage of the increased protection.

Changes in Classification: New Products?

The previous section described a model for explaining changes in the CN under the assumption that these changes had a protectionist intent. As has been observed above, however, changes in the tariff schedule can also take place as a result of the introduction of new products to the market. To determine whether tariff reshuffling is merely a reflection of this phenomenon, I regress the change in the number of tariff lines against the number of U.S. patent applications and its first five lags, as well as the number of firms and an intra-industry trade index. The overall number of U.S. patent applications is used as an indicator of world technological output. A greater number of firms translates into more products, while industries with high intra-industry trade have more differentiated products.

Empirical Specification

To test whether the number of tariff lines in an industry reflects protectionist lobbying or whether it is merely a reflection of the number of products in the market, I estimate the equation:

$$lines_{it} = \beta t_{it} + \delta PROD_{it} + \nu_i + \varepsilon_{it} \qquad (1)$$

where $lines_{it}$ denotes the number of tariff lines in industry i and time t; t_{it} denotes the tariff rate; $PROD_{it}$ is the vector of controls for the number of products available; ν_i is the industry-specific fixed effect, which is included to account for any time-invariant unobserved factors; and ε_t is the error term. Variables are measured in natural logs so as to ease interpretation of the coefficients. Two forms of this equation are estimated. In one version, the independent variables are unweighted. In the other version, the independent variables are weighted by the share of votes the country has in the Council of Ministers,

so as to give greater weight to countries with a greater share of votes. The number of votes each country has is shown in Table 4-1.

Again, because the tariff rate is not an accurate reflection of the overall level of protection in an industry, I also estimate a regression using an industry's political-economy characteristics to proxy for protection:

$$lines_{it} = \beta PE_{it} + \delta PROD_{it} + v_i + \varepsilon_{it} \quad (2)$$

where PE_{it} denotes the vector of political-economy characteristics and the other variables are as defined above. Both an unweighted and a weighted specification are also estimated.

The final step consists of specifying the decision-making—and hence the lobbying—process, which is required in estimating equation (2). As mentioned previously, industries can choose to lobby their national governments or the European Commission.

National lobbying

If firms are choosing to lobby their national governments for protection, then the determination of the protection level received by an industry can be modeled as a two-stage process. In the first stage, firms lobby their governments for an increase in protection. Politicians in each country would then maximize their overall political support by choosing the level of protection for that industry (Hillman, 1982). The resulting level of protection, according to a "decisive voter" model, will be the one preferred by the decisive country. Which country is decisive in turn depends on how decisions are made. If it is a majority-voting process, the decisive country will be the median. Under qualified majority, the decisive country will be the one whose characteristics lie at the 71st percentile; and if it is unanimity, the decisive country will be the one lying at either end of the distribution. Furthermore, since bargaining tends to occur between countries, protection could also reflect logrolling, or vote trading. If France very much wants a high tariff on wine and Portugal strongly prefers textile quotas they could logroll and end up

with higher protection on both goods. Taking logrolling, then, as another decision rule, if decisions are made via majority voting, logrolling implies that decisions are made at a higher percentile, such as the 60th percentile, whereas if it is qualified majority voting, they are made at a percentile higher than the 71st (such as the 80th).

This implies that equation (2) becomes

$$lines_{it} = \beta PE_{it}^{pct} + \delta PROD_{it} + \nu_i + \varepsilon_{it} \qquad (3)$$

where PE_{it}^{pct} is the vector of the decisive-country's characteristics at percentile *pct*. The industry characteristics actually used in the regressions are those lying at the relevant percentile, where the percentile used can be ascending or descending, depending on the sign prediction. To illustrate this, suppose two of the political-economy characteristics used are the share of industry employment in the country and the wage rate in the industry, the former of which is predicted to be positively related to changes in the classification and the latter negatively related. For those with the positive relation, the percentile is, in this case, the 60th; but for those showing a negative relationship, the appropriate percentile is the 40th rather than the 60th.

Pan-European lobbying

Because it is the European Commission that sets the agenda, it is also possible for lobbying to occur at the pan-European level. This in turn implies a model that considers the EU as a country, rather than as a group of countries, which is precisely the type of model that has been used to explain tariff formation in the United States. As in the first stage of the decisive-country framework, the outcome can be modeled using the political-support function approach. This time, however, it is the European Commission that selects the vector of protectionist measures to maximize a political support function, with the solution to the maximization problem being the EU's preferred protection level for a particular commodity. The Commission is then weighing increased support from firms across the EU against the dissatisfaction from European consumers, who oppose an increase in protection. Since each country is now taken to be analogous to a state in the

U.S., their industry characteristics are aggregated across the EU. Hence, the variables on industry characteristics will be aggregated so as to represent the characteristics of the EU as a whole rather than a decisive country within the EU. In other words, the number of firms in the textile industry in Portugal, for instance, will be added to the number of firms in France, Italy, Greece and so forth. To put it differently, instead of using the number of firms in an industry for one country, I will be now using the number of firms in an industry for the entire EU. The transformed variables are then regressed against the change in the number of tariff lines. No weighted specification is constructed in this case, since if lobbying is taking place at the European level, the number of votes each country has in the Council of Ministers is not relevant.

Data

Variables

In order to determine whether it is protectionist lobbying or the introduction of new products that best explains changes in the EU's Combined Nomenclature, the number of tariff lines are assumed to be a function of various economic and political factors, as in equation (2). Protection is measured by the tariff rate and by a vector of political-economy characteristics, which proxy for the overall level of protection in an industry. The political-economy characteristics included are the employment share of sector *i* in the country's total employment, the number of firms in the industry, the wage per worker, the labor cost share, the intra-industry trade, the import penetration ratio, the change in the import penetration ratio and the share of exports in production. The variables used to represent the introduction of new products are the number of patent applications, the number of firms and the intra-industry trade index. For a description of variable construction, see Table 4-2. Summary statistics are presented in Table 4-3. The sample includes 1104 observations for 92 manufacturing industries (listed in Appendix Table C) and 12 years (1987-99).

Tariffs and customs classification

Tariffs were obtained from various issues of the *Official Journal of the European Communities*, which publishes the common tariff schedule annually. In general, these duties enter into force on January 1 of the following year. The data were collected for publication year, rather than the years when the tariffs entered into force.

Import duties are expressed in three ways: as *ad valorem* tariffs equal to a percentage of the product's value; as specific tariffs per unit weight, volume, or number of pieces; or as a combination of the two. In all cases, tariffs are based on the CIF value (cost, insurance, freight). Duties are expressed as conventional duties, meaning that they are applicable to imported goods originating in countries which are contracting parties to the GATT, or with which the EU has concluded agreements containing the most-favored nation tariff. Autonomous duties are also reported; these are applicable whenever conventional duties are higher or non-existent. For the purposes of this paper, conventional *ad valorem* duties are used. Data were collected for every other year, beginning with the 1987 issue, which was the first year tariffs were classified in the Combined Nomenclature.

Tariff rates data for this period were in the Combined Nomenclature (CN), which needed to be converted to the 3-digit level of NACE Rev. 1. NACE Rev. 1 is a 4-digit classification that was drawn up in 1990 and designed to be a more detailed version of ISIC Rev. 3. No correspondence table was available to match NACE Rev. 1 to CN. However, NACE Rev. 1 is directly related to the 6-digit CPA (Statistical Classification of Products by Activity), matching it exactly at the 4-digit level. A correspondence table between CPA and CN is available from the EU's RAMON nomenclatures server.

Some of the NACE Rev. 1 categories corresponded to only one CN, but in most cases, there were several CN that made up one NACE Rev. 1 industry. Rather than simply averaging all the corresponding tariff rates, which would have made it difficult to accurately reflect the size of changes in the level of protection, it was decided to add up

the EU's exports to and imports from the rest of the world in 1988 for each CN, then find the percentage of trade each of those products represented within each NACE Rev. 1. All products that accounted for at least 10% of the trade in an industry were used in determining the tariff for that industry. For the industries where no product met that threshold, or for those where all the products meeting that threshold, taken together, did not account for at least 50% of the trade, all the products with the highest trade percentage and which, when added up, met the threshold, were used. Tariff rates were then aggregated using the import share as weight.

In 1997 and 1999, conventional duties for Chapters 1-24 were split into two periods, January 1-June 30 and July 1-December 31. For these cases, the tariffs were simply averaged to reflect the tariff for that particular year.

This period also had a number of cases where a particular category split into two or more categories with different tariff rates. For instance, CN 3901 20 00 (Polyethylene having a specific gravity of 0.94 or more) split into two categories in 1997: 3901 20 10 and 3901 20 90. Duties for the former were 0 in 1997, while those for the latter were 10.1. The tariff for the whole category was reported to be the average of the two, or 5.05.

Industry

Data for the period were taken from Eurostat's Structural Business Statistics, which is part of the NewCronos database. Because the data were not available at the 4-digit level for the period before 1995, and because of the high frequency of missing data, it was decided to use the 3-digit level of NACE Rev. 1 for the purposes of this paper.

Because the industry data contained missing data, I collected data for every year, rather than every other year. In cases where the previous and next year's data were available, I used them to interpolate the values. This was not always possible, since there were instances where only the previous year's or the next year's was available (but not both). In those cases, I simply used the data that were available to fill in what was missing. I also established a criterion to determine whether I should keep an industry or

drop it for lack of data. As long as there were at least seven out of the total possible 14 countries available,[3] and sufficient years for interpolation to be used (meaning that it would have to have at least two of the earlier years and two of the later years) and as long as there were both industry and trade data available, I kept the industry. In the end, out of 120 industries, 94 industries were used.

Another complication arose from the fact that data before 1995 refers to enterprises employing 20 or more persons for all countries except Spain, Portugal, and Ireland. Data on firms employing less than 20 persons are available starting in 1995, though not for all country-industry pairs. In order to adjust the data to include small firms, I calculated, for each variable, the proportion represented by the small firms—for instance, in the case of production, I calculated the production share of small firms in total production for the three years available. These shares did not change much from one period to the next, so I averaged them and used them to calculate the values for all firms.

Trade

Data on exports and imports comes from Eurostat's Intra- and Extra-EU trade (Combined Nomenclature), Supplement 2. The data were aggregated from the 8-digit CN into the 3-digit NACE Rev. 1.

One problem with matching the trade data to the industry data is that the trade data refers to all firms, whereas, as mentioned above, the industry data is provided only for firms employing 20 or more persons. As indicated, I performed a correction to alleviate the problem.

Patent

Data on U.S. patent applications were obtained from the NBER Patent Citations Data File, which was assembled by Bronwyn H. Hall, Adam B. Jaffe, and Manuel

[3] I combine the industry data for Belgium and Luxembourg because the trade data is not provided for each country separately.

Trajtenberg.[4] The patent data are in the U.S. Patent Classification, which needed to be matched to the 3-digit NACE Rev. 1. No correspondence table was available, so I developed a correlation between the two on the basis of their description and documentation. Not all industries could be matched to the patent categories, so that the sample of industries was decreased to 92.

Predictions

Political-economy hypothesis

If the EU's tariff classification reflects lobbying for protection, then the number of tariff lines should be higher the greater is the level of protection in an industry. If the tariff rate is used as the measure of protection, then the number of tariff lines should be higher in industries with higher tariffs. Since tariffs are not the only available means of protecting an industry, I also test the political-economy hypothesis using an industry's political-economy characteristics as a proxy for the level of protection that industry receives. The variables chosen are the ones that have been used in previous empirical work, and is mostly based on the list of key findings provided in Rodrik (1995). In particular, the literature predicts that protection (and hence, the number of tariff lines) is higher in an industry the

• Larger the industry: the larger the industry seeking protection, the greater is the incentive to observe and perhaps join in setting the protection level. The size of the industry is measured by the share of employment in the industry.

• The smaller the number of firms: a smaller number of firms alleviates the free rider problem in coordinating a lobby, thus increasing the level of protection. Many studies, however, find a positive, rather than a negative, effect.[5] Hillman (1991) and Hillman et al. (2001) argue that lobbying can be regarded as a case of private provision of a public good, since when successful, it provides a public good-type benefit—increased

[4] See Hall et al. (2001) for details on the database.

[5] See Potters and Sloof (1996) for a survey of empirical work

protection—to all firms. A larger contribution by one firm does not necessarily decrease the contribution of other firms; as a result, increasing the number of firms in an industry can either increase or decrease the overall lobbying effort. Pecorino (1998) analyzes this issue in a repeated tariff lobbying game where cooperation may be maintained through the use of trigger strategies, so that the difficulty of maintaining cooperation is measured by the critical value of the discount parameter. He finds that the effect of an increase in the number of firms in the industry on the ability of maintaining cooperation is indeterminate.

• The lower the wage: disadvantaged industries often receive more protection. An industry is disadvantaged if it is a low-skill, and hence low-wage industry (Trefler 1993).

• Higher its labor-intensity: the more labor-intensive an industry, the more labor votes it has. This is measured by the labor cost share.

• The lower the intra-industry trade: industries seeking protection will find their task harder if they must counter not only consumer dissatisfaction, but also producers who purchase their goods as intermediates (Marvel and Ray, 1987).

• The higher the import penetration: the higher the import penetration, the more will the affected industry lobby for protection, so as to decrease competition and maintain its market share (Trefler 1993). The theoretical literature, however, predicts an ambiguous relationship. In particular, the Grossman and Helpman (1994) political-economy model predicts that, if industries are organized, protection should be higher in industries with low import penetration, and if they are not organized the relationship between protection and import penetration should be positive. Models predicting a negative relationship include Mayer (1984), Hillman (1982) and Findlay and Wellisz (1982).

• The greater the rise in import penetration: Declining sectors (those with large increases in import penetration) tend to receive more protection so as to reduce adjustment costs (Olarreaga et. al, 1999).

• The smaller the share of exports in production: export-oriented industries do not require protection either because they face no import competition or because, with intra-industry trade, protection will provoke unwanted foreign retaliation (Trefler 1993).

Finally, a dummy is included to control for the Uruguay trade round, which took place more or less at the same time as the third enlargement.[6] This is predicted to have an ambiguous relationship with the number of tariff lines. On the one hand, tariff rates have fallen as a result of trade rounds. However, there has been an increased reliance on NTBs, so that even though tariffs might have fallen, the overall level of protection might actually have increased. Finally, as observed above, reclassifications have occurred as a result of multilateral negotiations, so that its effect on the number of tariff lines becomes less clear.

New Product Hypothesis

Finally, because changes in the CN can also occur because of the introduction of new products into the market, increases in the number of tariff lines take place:

• The greater the number of firms in the industry: The more firms in an industry, the more products will be produced, and hence the greater the number of tariff lines.

• The higher the intra-industry trade: Intra-industry trade occurs because of firms in different countries producing different differentiated products (Krugman 1981). An increase in intra-industry trade, then, means that there is a greater number of differentiated products, which in turn translates into a higher number of tariff lines.

• The greater the number of patent applications: A higher number of patent applications indicates a higher technological output (OECD 1994), which in turn implies an increase in the number of new products introduced in the market. If changes in the classification are being made to make the tariff schedule better conform to the actual

[6] The Uruguay Round began following the accession of Spain and Portugal in 1986, and concluded in 1993.

selection of products in the market, then an increase in the number of patent applications should cause an increase in the number of lines.

Results

Results using the tariff rate as the measure of protection are shown in Table 4-4, while those using an industry's political-economy characteristics are presented in Tables 4-5 through 4-10. In column 1 of Table 4-4, the coefficient on the tariff rate is significant and has the predicted sign, as does the coefficient on the intra-industry trade index, while the second lag in the number of patent applications displays a negative, rather than the expected positive sign. Adding industry dummies in column 2 does not alter the significance of the tariff rate or the intra-industry trade index, though the coefficients do decrease. When time dummies are added in column 3, all the coefficients on the new product variables become insignificant, while the tariff rate has a similar coefficient as in column 2. This suggests that a one percent increase in the tariff rate translates into a 0.05% increase in the number of tariff lines.

Tariffs, however, are not the sole instrument available for protection. Because of the difficulty in measuring the actual level of protection, I use an industry's political-economy characteristics as a proxy. To test how well that hypothesis performs in comparison with the new product hypothesis, I perform F-tests on the joint significance of the coefficients. Tables 4-5 and 4-6 present the results from simple OLS regressions, with each column using a different percentile of the political-economy characteristics to account for the different decision rules possible in the EU. In Table 4-5, the political-economy variables are unweighted, while in Table 4-6 they are weighted by the number of votes that each country has in the Council of Ministers (see Table 4-1). In both cases, the political-economy hypothesis performs better than the new product hypothesis, as the coefficients are more highly significant, with only the labor cost share and the export share having a sign different from the one predicted. Also, it is found that the highest

percentile voting rule performs better in explaining the number of tariff lines, suggesting that decisions are made via unanimity, or that logrolling has occurred.

Adding industry dummies does not alter that conclusion, though the political-economy hypothesis performs only slightly better than the new product hypothesis in all but the second and the last column of Table 4-7, and in the second, third, and last column of Table 4-8. In all of those cases, the F-statistic on the new product hypothesis is insignificant while that on the alternative is highly significant. Here, the labor cost share and the export share have the correct sign under one decision rule, while the wage rate switches signs in one instance, as does the intra-industry trade index in nearly all cases. Finally, adding industry dummies turned the coefficient on the Uruguay Round dummy positive, rather than negative as it was in the simple OLS regressions. This indicates that negotiated decreases in tariffs did in fact result in an increase in the number of tariff lines. In terms of the new product hypothesis, the intra-industry trade index has the correct sign in all instances where it is significant, while the number of patent applications shows a negative, rather than a positive sign. The number of firms displays a negative sign only in one decision rule when variables are weighted by the number of votes (Table 4-8), but exhibits the expected positive sign in the one instance it is significant when variables are unweighted (Table 4-7). In terms of which voting model explains the number of tariff lines better, again it is the highest percentile rule that performs better in the unweighted case. In the weighted specification, however, it is the qualified-majority voting rule that has the highest R-squared, though it is only marginally better than the highest percentile.

As a final test of the robustness of the results, time dummies are added in addition to the industry dummies.[7] The results, shown in Tables 4-9 and 4-10, again suggest that protection does play a role in how goods are classified in the EU's customs classification, as the political-economy hypothesis again performs better than the new product variables,

[7] In this case, the Uruguay Round dummy is dropped, since the year dummies would account for it.

with the latter being jointly insignificant in some cases. As in the previous case, the labor cost share and the export share have the correct sign under one decision rule, while the wage rate switches signs in one instance, as does the intra-industry trade index in nearly all cases. None of the signs on the new product variables are as expected in the cases where the coefficient is significant, further suggesting that the tariff classification reflects protectionist lobbying.

These results then suggest that changes in the EU's customs classification have occurred mainly as a result of lobbying by firms seeking to protect their industries, rather than the presence of new products in the market.

Conclusions

This paper took a first pass at explaining changes in the EU's tariff classification and exploring whether they arise out of political-economy considerations, as the anecdotal evidence seems to suggest, or merely from the introduction of new products into the market. Customs classification is an important element in a country's trade policy. How a good is classified can affect the rate of duty that applies, the coverage of non-tariff barriers, and the formulation and application of rules of origin. The nomenclature can also impact multilateral agreements. Tariff reductions are negotiated on a range of products, and the decision as to whether the tariff on a particular good should be reduced depends on whether the good falls within the list. Whether the product belongs in the list in turn depends on the country's customs nomenclature.

If changes to the CN are a result of lobbying pressure from protectionist interests, then industries with higher tariffs should experience an increase in the number of subheadings, while a decrease in the number of subheadings should be observed in industries with low tariffs as products are moved to higher tariff categories. If it is assumed that any changes result in greater protection for the industry involved, it becomes possible to model the decision-making process in the same way as tariff determination. Of course, tariffs are not the sole instrument of protection and hence are

not the only reason firms would lobby for a change in classification. Non-tariff barriers, however, are difficult to measure, so it becomes necessary to proxy for protection using an industry's political-economy characteristics. To determine whether the EU's tariff classification reflects lobbying with the intent of increasing protection, then, I tested this hypothesis against the alternative that how goods are classified is merely a result of new products or technologies.

Empirical results suggest that changes in the EU's customs classification can be explained by political-economy considerations. These results are robust to how protection is measured and how the lobbying process is defined.

Table 4-1—Distribution of Votes in Nomenclature Committee and Council of Ministers

Country	Number of Votes
Austria, Sweden	4
Belgium, Netherlands	5
Denmark, Ireland, Finland	3
France, Germany, Italy	10
Greece, Portugal	5
Luxembourg	2
Spain	8
UK	10

Source: European Communities (1999).

Table 4-2—Variable Sources and Definitions

Variable	Definition	Source	Years
Tariff Lines	number of tariff lines	*Official Journal of the European Communities,* various years	1987-99
Tariff	common customs tariff ad valorem, conventional duties	*Official Journal of the European Communities,* various years	1987-99
Share of employment	employment in sector *i* divided by the total number of employees in the country	Structural Business Statistics, NewCronos database	1987-99
Wage	wages divided by employment, in ¤ 1999	Structural Business Statistics, NewCronos database	1987-99
Labor cost share	labor costs divided by the value of production	Structural Business Statistics, NewCronos database	1987-99
Import Penetration (%)	value of imports divided by apparent consumption (production value plus value of imports minus value of exports), times 100	Eurostat's EEC External Trade (Nimexe) 1976-87 Supplement 2 and Intra- and Extra-EU trade (Combined Nomenclature), Supplement 2	1987-99
Δ Import Penetration (%)	import penetration in year *t* minus import penetration in year *t-1*	Eurostat's EEC External Trade (Nimexe) 1976-87 Supplement 2 and Intra- and Extra-EU trade (Combined Nomenclature), Supplement 2	1987-99
Export Share	value of exports divided by the value of production	Eurostat's EEC External Trade (Nimexe) 1976-87 Supplement 2 and Intra- and Extra-EU trade (Combined Nomenclature), Supplement 2	1987-99
# Firms	number of enterprises	Structural Business Statistics, NewCronos database	1987-99
Intra-industry Trade	Grubel-Lloyd index of intra-industry trade, defined as one minus (absolute value of exports minus imports divided by exports plus imports)	Eurostat's EEC External Trade (Nimexe) 1976-87 Supplement 2 and Intra- and Extra-EU trade (Combined Nomenclature), Supplement 2	1987-99
Patents	number of patent applications	NBER Patent Citations Data File	1987-99

Table 4-3—Summary Statistics

	Mean	Std Dev	Min	Median	Max	# of Obs.
# Tariff Lines	96.653	118.089	1	54	997	13818
Tariff Dev.	1.059	1.422	0	0.869	15.361	7050
Tariff (%)	5.628	7.728	0	4.511	77.574	8084
Share of employment (%)	1.165	1.296	0	0.696	10.087	11687
Wage (1000 Euro/worker)	23.950	9.766	0.586	23.505	293.819	11687
Labor cost share (%)	23.709	9.072	1.171	23.677	78.594	11687
Import Penetration (%)	19.915	22.359	0	11.010	99.836	11687
Δ Import Penetration (%)	0.473	4.855	-75.051	0.077	64.847	11687
Export Share (#)	17.734	18.153	0	12.335	99.753	11687
# Firms	677.107	2431.855	1	134	48140	11687
Intra-Industry Trade (%)	56.269	27.543	0	58.735	100	11687
# Patents (1000s)	23.090	42.003	0	8.995	421.374	14536

Note: The share of employment, labor intensity, intra-industry trade index and the export share are scaled to percentage terms.

Sources: See Table 4-2.

Table 4-4—Explaining Customs Classification; Tariff Rate as Instrument of Protection

		(1)	(2)	(3)
Political-economy	Tariff	0.127	0.047	0.049
		(0.056)**	(0.019)**	(0.020)**
New product	# Firms	0.027	0.010	-0.025
		(0.044)	(0.011)	(0.019)
	Intra-industry	1.116	0.179	0.065
		(0.202)***	(0.047)***	(0.047)
	Patent	0.009	-0.021	-0.026
		(0.125)	(0.018)	(0.032)
	Patent (-1)	0.312	0.013	0.003
		(0.215)	(0.027)	(0.042)
	Patent (-2)	-0.834	-0.0004	0.012
		(0.425)**	(0.039)	(0.042)
	Patent (-3)	0.934	0.046	0.066
		(0.610)	(0.074)	(0.082)
	Patent (-4)	-0.326	0.005	-0.030
		(0.647)	(0.064)	(0.068)
	Patent (-5)	0.216	-0.017	-0.102
		(0.505)	(0.065)	(0.072)
Obs		552	552	552
Adjusted R-squared		0.2700	0.9921	0.9924
R-squared (within)			0.1404	
F-stat (new product)		23.33	9.63	1.16
F-stat (political econ)		5.05	5.89	6.19
Industry fixed effects?		no	yes	yes
Time fixed effects?		no	no	yes

Note: Dependent variable is ln(number of tariff lines). Panel regressions were run for 92 industries over 6 years (every other year from 1988-1999). Heteroskedasticity-consistent standard errors are in parenthesis. Estimates marked *** are significant at the 1-percent level; those marked ** are significant at the 5-percent level; and * denotes significance at the 10-percent level. All variables are in logs. Tariff Dev. represents the log-difference between the tariff rate and the mean tariff across industries. Each column consists of one regression, with the headings indicating the voting model. Lowest and highest refer to the models testing unanimity; median tests the median-voter model; QMV tests the qualified-majority voting requirement (equivalent to the 71st percentile); and the 60th and 80th percentiles refer to the logrolling models. The EU-wide regression tests the hypothesis that the EU is acting as a country when setting tariffs. See Table 4-2 for sources.

Table 4-5—Unweighted OLS Regressions Explaining Customs Classification

		Decisive Country						EU-Wide
		Lowest	Median	60th Pctile	QMV	80th Pctile	Highest	EU
Pol.-econ.	Share emp	0.296	0.403	0.418	0.341	0.372	0.258	0.522
		(0.042)**	(0.052)**	(0.051)**	(0.046)**	(0.045)**	(0.036)**	(0.051)**
	# Firms	0.279	0.066	-0.042	-0.003	-0.053	0.164	-0.039
		(0.108)**	(0.055)	(0.044)	(0.043)	(0.046)	(0.035)**	(0.038)
	Wage	-0.236	-0.730	-0.447	-0.102	0.004	0.129	-0.543
		(0.101)*	(0.192)**	(0.169)**	(0.155)	(0.145)	(0.084)	(0.175)**
	Labor cost share	-0.452	-1.110	-1.052	-1.293	-1.302	-1.381	-0.889
		(0.058)**	(0.091)**	(0.102)**	(0.113)**	(0.120)**	(0.127)**	(0.073)**
	Intra-industry	-1.462	1.141	0.598	0.732	0.591	0.641	-0.094
		(0.580)*	(0.344)**	(0.333)	(0.280)**	(0.278)*	(0.242)**	(0.175)
	Import pen.	0.535	0.480	0.481	0.449	0.403	0.446	0.590
		(0.032)**	(0.032)**	(0.031)**	(0.031)**	(0.031)**	(0.032)**	(0.038)**
	Δ Import pen.	0.001	-0.067	-0.070	-0.058	-0.023	-0.010	-0.029
		(0.003)	(0.016)**	(0.014)**	(0.012)**	(0.008)**	(0.003)**	(0.014)*
	Export share	0.098	0.957	1.336	2.469	3.401	4.415	0.114
		(0.187)	(0.349)**	(0.358)**	(0.362)**	(0.336)**	(0.367)**	(0.354)
	Uruguay round	-0.239	-0.249	-0.224	-0.236	-0.208	-0.195	-0.229
		(0.070)**	(0.067)**	(0.069)**	(0.068)**	(0.069)**	(0.065)**	(0.068)**
New Prod.	# Firms	-0.254	-0.007	0.058	0.088	0.100	0.043	-0.039
		(0.126)*	(0.048)	(0.045)	(0.047)	(0.047)*	(0.034)	(0.038)
	Intra-Industry	1.071	0.141	0.327	0.290	0.427	0.621	-0.094
		(0.187)**	(0.175)	(0.173)	(0.155)	(0.146)**	(0.113)**	(0.175)
	Patent	-0.011	-0.050	-0.011	0.025	0.049	0.068	-0.054
		(0.051)	(0.052)	(0.052)	(0.050)	(0.049)	(0.045)	(0.053)
	Patent (-1)	0.271	0.281	0.236	0.222	0.188	0.133	0.293
		(0.123)*	(0.122)*	(0.123)	(0.119)	(0.116)	(0.112)	(0.128)*
	Patent (-2)	-0.568	-0.512	-0.462	-0.486	-0.426	-0.345	-0.549
		(0.277)*	(0.262)	(0.263)	(0.257)	(0.252)	(0.249)	(0.281)
	Patent (-3)	-0.022	-0.038	0.043	0.115	0.066	0.172	-0.040
		(0.382)	(0.354)	(0.357)	(0.352)	(0.344)	(0.331)	(0.396)
	Patent (-4)	0.219	0.053	0.056	0.066	0.138	0.303	0.030
		(0.416)	(0.374)	(0.376)	(0.368)	(0.364)	(0.352)	(0.416)
	Patent (-5)	0.240	0.468	0.329	0.255	0.163	-0.158	0.606
		(0.337)	(0.299)	(0.303)	(0.301)	(0.299)	(0.299)	(0.334)
Obs		1104	1104	1104	1104	1104	1104	1104
Adjusted R-squared		0.4539	0.5438	0.5305	0.5420	0.5511	0.5692	0.5017
F-stat (political econ)		44.50	64.07	57.23	51.02	55.90	56.02	92.39
F-stat (new product)		6.06	5.02	5.55	6.42	7.18	11.38	6.87
Ind. fixed effects?		no	no	no	no	no	no	no
Time fixed effects?		no	no	no	no	no	no	no

Note: Dependent variable is ln(number of tariff lines). Panel regressions were run for 92 industries over 12 years (1988-1999). Heteroskedasticity-consistent standard errors are in parenthesis. Estimates marked ** are significant at the 1-percent level; those marked * are significant at the 5-percent level. All variables are in logs, with the exception of the change in import penetration and the Uruguay trade round dummy (which equals 1 starting in 1993). Each column consists of one regression, with the headings indicating the voting model. Lowest and highest refer to the models testing unanimity; median tests the median-voter model; QMV tests the qualified-majority voting requirement (equivalent to the 71st percentile); and the 60th and 80th percentiles refer to the logrolling models. The EU-wide regression tests the hypothesis that the EU is acting as a country when setting tariffs. See Table 4-2 for sources.

Table 4-6—Weighted OLS Regressions Explaining Customs Classification

		Decisive Country						EU-Wide
		Lowest	Median	60th Petile	QMV	80th Petile	Highest	EU
Pol.-econ.	Share emp	0.296	0.393	0.376	0.314	0.343	0.258	0.522
		(0.042)**	(0.046)**	(0.048)**	(0.046)**	(0.045)**	(0.036)**	(0.051)**
	# Firms	0.279	0.122	0.246	0.222	0.154	0.164	-0.039
		(0.108)**	(0.052)*	(0.052)**	(0.050)**	(0.040)**	(0.035)**	(0.038)
	Wage	-0.236	-0.986	-0.774	-0.224	-0.190	0.129	-0.543
		(0.101)*	(0.200)**	(0.183)**	(0.181)	(0.145)	(0.084)	(0.175)**
	Labor cost share	-0.452	-1.128	-1.261	-1.252	-1.421	-1.381	-0.889
		(0.058)**	(0.093)**	(0.100)**	(0.105)**	(0.111)**	(0.127)**	(0.073)**
	Intra-industry	-1.462	1.179	0.800	0.746	0.892	0.641	-0.094
		(0.580)*	(0.302)**	(0.297)**	(0.290)*	(0.261)**	(0.242)**	(0.175)
	Import pen.	0.535	0.465	0.457	0.482	0.405	0.446	0.590
		(0.032)**	(0.032)**	(0.032)**	(0.032)**	(0.032)**	(0.032)**	(0.038)**
	Δ Import pen.	0.001	-0.051	-0.066	-0.059	-0.033	-0.010	-0.029
		(0.003)	(0.015)**	(0.014)**	(0.011)**	(0.009)**	(0.003)**	(0.014)*
	Export share	0.098	0.769	1.468	1.645	3.687	4.415	0.114
		(0.187)	(0.322)*	(0.328)**	(0.307)**	(0.348)**	(0.367)**	(0.354)
	Uruguay round	-0.239	-0.293	-0.257	-0.209	-0.273	-0.195	-0.229
		(0.070)**	(0.066)**	(0.065)**	(0.067)**	(0.067)**	(0.065)**	(0.068)**
New Prod.	# Firms	-0.254	-0.058	-0.142	-0.086	-0.043	0.043	-0.039
		(0.126)*	(0.046)	(0.047)**	(0.047)	(0.046)	(0.034)	(0.038)
	Intra-Industry	1.071	0.075	0.211	0.270	0.297	0.621	-0.094
		(0.187)**	(0.162)	(0.160)	(0.156)	(0.150)*	(0.113)**	(0.175)
	Patent	-0.011	-0.047	-0.027	-0.001	0.032	0.068	-0.054
		(0.051)	(0.052)	(0.051)	(0.049)	(0.049)	(0.045)	(0.053)
	Patent (-1)	0.271	0.263	0.252	0.217	0.179	0.133	0.293
		(0.123)*	(0.122)*	(0.120)*	(0.117)	(0.116)	(0.112)	(0.128)*
	Patent (-2)	-0.568	-0.454	-0.478	-0.438	-0.381	-0.345	-0.549
		(0.277)*	(0.259)	(0.256)	(0.254)	(0.254)	(0.249)	(0.281)
	Patent (-3)	-0.022	-0.132	-0.006	0.053	0.089	0.172	-0.040
		(0.382)	(0.350)	(0.356)	(0.351)	(0.338)	(0.331)	(0.396)
	Patent (-4)	0.219	0.139	0.085	0.080	0.085	0.303	0.030
		(0.416)	(0.371)	(0.372)	(0.364)	(0.354)	(0.352)	(0.416)
	Patent (-5)	0.240	0.463	0.393	0.277	0.201	-0.158	0.606
		(0.337)	(0.300)	(0.298)	(0.297)	(0.292)	(0.299)	(0.334)
Obs		1104	1104	1104	1104	1104	1104	1104
Adjusted R-squared		0.4539	0.5524	0.5590	0.5488	0.5572	0.5692	0.5017
F-stat (political econ)		44.50	68.10	62.16	60.77	58.40	56.02	92.39
F-stat (new product)		6.06	6.51	7.97	5.52	7.65	11.38	6.87
Ind. fixed effects?		no	no	no	no	no	no	no
Time fixed effects?		no	no	no	no	no	no	no

Note: Dependent variable is ln(number of tariff lines). Variables are weighted by number of votes each country has in the Council of Ministers (see Table 4-1). Panel regressions were run for 92 industries over 12 years (1988-1999). Heteroskedasticity-consistent standard errors are in parenthesis. Estimates marked ** are significant at the 1-percent level; those marked * are significant at the 5-percent level. All variables are in logs, with the exception of the change in import penetration and the Uruguay trade round dummy (which equals 1 starting in 1993). Each column consists of one regression, with the headings indicating the voting model. Lowest and highest refer to the models testing unanimity; median tests the median-voter model; QMV tests the qualified-majority voting requirement (equivalent to the 71st percentile); and the 60th and 80th percentiles refer to the logrolling models. The EU-wide regression tests the hypothesis that the EU is acting as a country when setting tariffs. See Table 4-2 for sources.

Table 4-7—Unweighted Fixed-Effects Regressions Explaining Customs Classification

		Decisive Country						EU-Wide
		Lowest	Median	60th Pctile	QMV	80th Pctile	Highest	EU
Pol.-econ.	Share emp	0.038	0.021	0.026	0.053	0.034	-0.036	0.112
		(0.012)**	(0.018)	(0.019)	(0.019)**	(0.015)*	(0.015)**	(0.036)**
	# Firms	0.007	-0.002	0.0005	-0.012	-0.034	-0.017	0.003
		(0.011)	(0.008)	(0.008)	(0.009)	(0.009)**	(0.009)*	(0.008)
	Wage	0.054	-0.163	-0.077	-0.064	-0.036	-0.017	0.090
		(0.016)**	(0.070)**	(0.043)*	(0.045)	(0.027)	(0.014)	(0.062)
	Labor cost share	0.046	-0.107	-0.129	-0.068	0.030	-0.006	-0.209
		(0.014)**	(0.037)**	(0.050)**	(0.041)	(0.031)	(0.031)	(0.045)**
	Intra-industry	-0.167	0.256	0.077	0.071	0.051	0.142	0.111
		(0.083)*	(0.093)**	(0.096)	(0.069)	(0.052)	(0.059)**	(0.053)*
	Import pen.	-0.027	-0.006	-0.039	-0.003	-0.013	-0.064	-0.007
		(0.010)**	(0.016)	(0.018)*	(0.014)	(0.012)	(0.014)**	(0.024)
	Δ Import pen.	-0.0004	0.007	0.006	0.002	0.001	0.001	0.002
		(0.001)	(0.002)**	(0.002)**	(0.002)	(0.001)	(0.001)	(0.001)*
	Export share	-0.098	0.336	0.497	0.408	0.254	0.035	0.078
		(0.040)**	(0.105)**	(0.114)**	(0.109)**	(0.119)*	(0.116)	(0.177)
	Uruguay round	0.064	0.045	0.051	0.053	0.056	0.062	0.069
		(0.013)**	(0.011)**	(0.013)**	(0.013)**	(0.012)**	(0.012)**	(0.015)**
New Prod.t	# Firms	-0.013	0.008	-0.004	0.005	0.023	0.008	0.003
		(0.015)	(0.010)	(0.010)	(0.010)	(0.010)*	(0.008)	(0.008)
	Intra-Industry	0.163	0.026	0.084	0.090	0.112	0.092	0.111
		(0.039)**	(0.039)	(0.041)*	(0.036)**	(0.034)**	(0.028)**	(0.053)*
	Patent	-0.013	-0.014	-0.012	-0.012	-0.011	-0.011	-0.008
		(0.008)*	(0.008)*	(0.007)*	(0.008)	(0.007)	(0.007)	(0.007)
	Patent (-1)	-0.006	0.009	0.009	0.006	0.001	-0.003	0.003
		(0.017)	(0.016)	(0.016)	(0.017)	(0.016)	(0.016)	(0.016)
	Patent (-2)	0.039	0.009	0.005	0.012	0.023	0.031	0.015
		(0.033)	(0.031)	(0.031)	(0.032)	(0.031)	(0.031)	(0.032)
	Patent (-3)	-0.004	-0.023	-0.023	-0.016	-0.012	0.003	-0.001
		(0.047)	(0.047)	(0.046)	(0.047)	(0.048)	(0.048)	(0.047)
	Patent (-4)	0.025	0.019	0.019	0.018	0.020	0.023	0.023
		(0.046)	(0.045)	(0.046)	(0.047)	(0.046)	(0.046)	(0.046)
	Patent (-5)	-0.055	-0.059	-0.056	-0.068	-0.059	-0.061	-0.065
		(0.046)	(0.046)	(0.046)	(0.046)	(0.046)	(0.046)	(0.047)
Obs		1104	1104	1104	1104	1104	1104	1104
Adjusted R-squared		0.1978	0.1942	0.1952	0.1751	0.1773	0.1997	0.1704
F-stat (political econ)		4.15	4.26	4.31	3.47	4.42	5.67	9.28
F-stat (new product)		3.74	1.85	2.31	2.67	3.97	4.97	1.42
Ind. fixed effects?		yes	yes	yes	yes	yes	yes	yes
Time fixed effects?		no	no	no	no	no	no	no

Note: Dependent variable is ln(number of tariff lines). Panel regressions were run for 92 industries over 12 years (1988-1999). Heteroskedasticity-consistent standard errors are in parenthesis. Estimates marked ** are significant at the 1-percent level; those marked * are significant at the 5-percent level. All variables are in logs, with the exception of the change in import penetration and the Uruguay trade round dummy (which equals 1 starting in 1993). The estimated equations also include a full set of industry dummies, which are not included in the calculation of the R-squared. Each column consists of one regression, with the headings indicating the voting model. Lowest and highest refer to the models testing unanimity; median tests the median-voter model; QMV tests the qualified-majority voting requirement (equivalent to the 71st percentile); and the 60th and 80th percentiles refer to the logrolling models. The EU-wide regression tests the hypothesis that the EU is acting as a country when setting tariffs. See Table 4-2 for sources.

Table 4-8—Weighted Fixed-Effects Regressions Explaining Customs Classification

		Decisive Country						EU-Wide
		Lowest	Median	60th Pctile	QMV	80th Pctile	Highest	EU
Pol.-econ.	Share emp	0.038	0.052	0.075	0.088	0.004	-0.036	0.112
		(0.012)**	(0.021)**	(0.019)**	(0.021)**	(0.019)	(0.015)**	(0.036)**
	# Firms	0.007	0.015	0.004	-0.022	0.009	-0.017	0.003
		(0.011)	(0.008)*	(0.009)	(0.007)**	(0.007)	(0.009)*	(0.008)
	Wage	0.054	-0.158	-0.056	-0.147	-0.031	-0.017	0.090
		(0.016)**	(0.057)**	(0.043)	(0.043)**	(0.027)	(0.014)	(0.062)
	Labor cost	0.046	-0.172	-0.231	-0.108	-0.113	-0.006	-0.209
	share	(0.014)**	(0.051)**	(0.057)**	(0.045)**	(0.040)**	(0.031)	(0.045)**
	Intra-industry	-0.167	0.116	0.043	-0.084	0.083	0.142	0.111
		(0.083)*	(0.071)	(0.078)	(0.076)	(0.060)	(0.059)**	(0.053)*
	Import pen.	-0.027	0.015	0.012	-0.020	-0.016	-0.064	-0.007
		(0.010)**	(0.017)	(0.015)	(0.016)	(0.013)	(0.014)**	(0.024)
	Δ Import pen.	-0.0004	0.005	0.004	0.003	0.001	0.001	0.002
		(0.001)	(0.002)**	(0.002)*	(0.002)	(0.001)	(0.001)	(0.001)*
	Export share	-0.098	0.241	0.310	0.506	0.373	0.035	0.078
		(0.040)**	(0.133)*	(0.121)**	(0.132)**	(0.160)**	(0.116)	(0.177)
	Uruguay round	0.064	0.045	0.056	0.048	0.050	0.062	0.069
		(0.013)**	(0.012)**	(0.012)**	(0.012)**	(0.013)**	(0.012)**	(0.015)**
New Prod.	# Firms	-0.013	-0.015	-0.013	-0.020	-0.006	0.008	0.003
		(0.015)	(0.010)	(0.010)	(0.010)*	(0.009)	(0.008)	(0.008)
	Intra-Industry	0.163	0.054	0.085	0.131	0.081	0.092	0.111
		(0.039)**	(0.031)*	(0.035)**	(0.036)**	(0.032)**	(0.028)**	(0.053)*
	Patent	-0.013	-0.014	-0.011	-0.016	-0.009	-0.011	-0.008
		(0.008)*	(0.007)*	(0.007)	(0.008)*	(0.007)	(0.007)	(0.007)
	Patent (-1)	-0.006	0.008	0.009	0.009	0.002	-0.003	0.003
		(0.017)	(0.016)	(0.016)	(0.016)	(0.016)	(0.016)	(0.016)
	Patent (-2)	0.039	0.017	0.006	0.012	0.019	0.031	0.015
		(0.033)	(0.032)	(0.032)	(0.032)	(0.032)	(0.031)	(0.032)
	Patent (-3)	-0.004	-0.027	-0.009	-0.017	-0.007	0.003	-0.001
		(0.047)	(0.047)	(0.047)	(0.047)	(0.048)	(0.048)	(0.047)
	Patent (-4)	0.025	0.025	0.014	0.023	0.020	0.023	0.023
		(0.046)	(0.046)	(0.046)	(0.046)	(0.047)	(0.046)	(0.046)
	Patent (-5)	-0.055	-0.053	-0.062	-0.062	-0.062	-0.061	-0.065
		(0.046)	(0.046)	(0.046)	(0.046)	(0.047)	(0.046)	(0.047)
Obs		1104	1104	1104	1104	1104	1104	1104
Adjusted R-squared		0.1978	0.1915	0.2010	0.2017	0.1737	0.1997	0.1704
F-stat (political econ)		4.15	5.66	4.35	5.27	4.04	5.67	9.28
F-stat (new product)		3.74	1.41	1.71	3.32	2.02	4.97	1.42
Ind. fixed effects?		yes	yes	yes	yes	yes	yes	yes
Time fixed effects?		no	no	no	no	no	no	no

Note: Dependent variable is ln(number of tariff lines). Variables are weighted by number of votes each country has in the Council of Ministers (see Table 4-1). Panel regressions were run for 92 industries over 12 years (1988-1999). Heteroskedasticity-consistent standard errors are in parenthesis. Estimates marked ** are significant at the 1-percent level; those marked * are significant at the 5-percent level. All variables are in logs, with the exception of the change in import penetration and the Uruguay trade round dummy (which equals 1 starting in 1993). The estimated equations also include a full set of industry dummies, which are not included in the calculation of the R-squared. Each column consists of one regression, with the headings indicating the voting model. Lowest and highest refer to the models testing unanimity; median tests the median-voter model; QMV tests the qualified-majority voting requirement (equivalent to the 71st percentile); and the 60th and 80th percentiles refer to the logrolling models. The EU-wide regression tests the hypothesis that the EU is acting as a country when setting tariffs. See Table 4-2 for sources.

Table 4-9—Unweighted Regressions Explaining Customs Classification Time and Industry Fixed Effects

		Decisive Country						EU-Wide
		Lowest	Median	60th Ptile	QMV	80th Ptile	Highest	EU
Pol.-econ.	Share emp	0.040	0.045	0.073	0.093	0.058	-0.025	0.182
		(0.012)**	(0.021)*	(0.023)**	(0.025)**	(0.017)**	(0.014)	(0.042)**
	# Firms	0.012	0.001	-0.008	-0.017	-0.038	-0.012	-0.051
		(0.011)	(0.008)	(0.009)	(0.009)	(0.010)**	(0.008)	(0.016)**
	Wage	0.051	-0.156	-0.062	-0.045	-0.032	-0.001	0.066
		(0.017)**	(0.073)*	(0.046)	(0.048)	(0.027)	(0.015)	(0.061)
	Labor cost	0.065	-0.112	-0.159	-0.086	0.022	-0.004	-0.207
	share	(0.017)**	(0.040)**	(0.055)**	(0.042)*	(0.032)	(0.030)	(0.049)**
	Intra-industry	-0.065	0.292	0.079	0.073	0.069	0.161	0.077
		(0.081)	(0.099)**	(0.099)	(0.072)	(0.053)	(0.062)**	(0.050)
	Import pen.	-0.035	-0.021	-0.054	-0.016	-0.021	-0.073	-0.032
		(0.010)**	(0.016)	(0.019)**	(0.014)	(0.012)	(0.015)**	(0.024)
	Δ Import pen.	0.000	0.008	0.007	0.003	0.001	0.001	0.003
		(0.001)	(0.002)**	(0.002)**	(0.002)	(0.001)	(0.001)	(0.001)*
	Export share	-0.109	0.368	0.517	0.396	0.193	-0.023	0.251
		(0.042)*	(0.108)**	(0.114)**	(0.112)**	(0.119)	(0.121)	(0.177)
New Prod.	# Firms	-0.053	-0.026	-0.033	-0.025	-0.003	-0.017	-0.051
		(0.020)**	(0.015)	(0.016)*	(0.016)	(0.013)	(0.013)	(0.016)**
	Intra-Industry	0.058	-0.049	0.019	0.019	0.045	0.024	0.077
		(0.039)	(0.049)	(0.050)	(0.041)	(0.036)	(0.031)	(0.050)
	Patent	-0.025	-0.024	-0.018	-0.022	-0.024	-0.026	-0.023
		(0.012)*	(0.011)*	(0.011)	(0.011)	(0.011)*	(0.011)*	(0.011)*
	Patent (-1)	0.002	0.015	0.013	0.012	0.009	0.006	0.012
		(0.019)	(0.018)	(0.018)	(0.019)	(0.018)	(0.018)	(0.019)
	Patent (-2)	0.053	0.007	0.002	0.009	0.025	0.038	0.014
		(0.037)	(0.036)	(0.035)	(0.036)	(0.035)	(0.036)	(0.036)
	Patent (-3)	-0.016	-0.024	-0.029	-0.020	-0.008	0.001	-0.011
		(0.051)	(0.052)	(0.051)	(0.052)	(0.052)	(0.052)	(0.052)
	Patent (-4)	0.011	-0.005	-0.013	-0.009	-0.003	-0.003	-0.006
		(0.048)	(0.048)	(0.049)	(0.049)	(0.049)	(0.049)	(0.048)
	Patent (-5)	-0.096	-0.099	-0.094	-0.112	-0.102	-0.105	-0.103
		(0.049)*	(0.048)*	(0.048)	(0.048)*	(0.049)*	(0.049)*	(0.050)*
Obs		1104	1104	1104	1104	1104	1104	1104
Adjusted R-squared		0.9934	0.9933	0.9934	0.9932	0.9932	0.9934	0.9932
F-stat (political econ)		3.59	4.15	3.31	2.55	3.07	4.61	5.67
F-stat (new product)		2.31	1.87	2.36	2.26	1.52	1.98	3.26
Ind. fixed effects?		yes	yes	yes	yes	yes	yes	yes
Time fixed effects?		yes	yes	yes	yes	yes	yes	yes

Note: Dependent variable is ln(number of tariff lines). Panel regressions were run for 92 industries over 12 years (1988-1999). Heteroskedasticity-consistent standard errors are in parenthesis. Estimates marked ** are significant at the 1-percent level; those marked * are significant at the 5-percent level. All variables are in logs, with the exception of the change in import penetration and the Uruguay trade round dummy (which equals 1 starting in 1993). The estimated equations also include a full set of industry and year dummies. Each column consists of one regression, with the headings indicating the voting model. Lowest and highest refer to the models testing unanimity; median tests the median-voter model; QMV tests the qualified-majority voting requirement (equivalent to the 71st percentile); and the 60th and 80th percentiles refer to the logrolling models. The EU-wide regression tests the hypothesis that the EU is acting as a country when setting tariffs. See Table 4-2 for sources.

Table 4-10—Weighted Regressions Explaining Customs Classification Time and Industry Fixed Effects

		Decisive Country						EU-Wide
		Lowest	Median	60th Pctile	QMV	80th Pctile	Highest	EU
Pol.-econ.	Share emp	0.040	0.075	0.107	0.131	0.035	-0.025	0.182
		(0.012)**	(0.021)**	(0.022)**	(0.024)**	(0.019)	(0.014)	(0.042)**
	# Firms	0.012	0.016	-0.002	-0.027	0.007	-0.012	-0.051
		(0.011)	(0.009)	(0.009)	(0.008)**	(0.008)	(0.008)	(0.016)**
	Wage	0.051	-0.130	-0.036	-0.142	-0.016	-0.001	0.066
		(0.017)**	(0.055)*	(0.044)	(0.042)**	(0.028)	(0.015)	(0.061)
	Labor cost share	0.065	-0.178	-0.255	-0.125	-0.125	-0.004	-0.207
		(0.017)**	(0.057)**	(0.061)**	(0.047)**	(0.042)**	(0.030)	(0.049)**
	Intra-industry	-0.065	0.149	0.036	-0.090	0.080	0.161	0.077
		(0.081)	(0.079)	(0.083)	(0.077)	(0.062)	(0.062)**	(0.050)
	Import pen.	-0.035	-0.007	-0.005	-0.040	-0.028	-0.073	-0.032
		(0.010)**	(0.018)	(0.015)	(0.016)*	(0.014)	(0.015)**	(0.024)
	Δ Import pen.	0.000	0.006	0.005	0.004	0.002	0.001	0.003
		(0.001)	(0.002)*	(0.002)*	(0.002)*	(0.001)	(0.001)	(0.001)*
	Export share	-0.109	0.350	0.345	0.513	0.377	-0.023	0.251
		(0.042)*	(0.139)*	(0.121)**	(0.130)**	(0.162)*	(0.121)	(0.177)
New prod.	# Firms	-0.053	-0.041	-0.040	-0.053	-0.031	-0.017	-0.051
		(0.020)**	(0.015)**	(0.017)*	(0.018)**	(0.018)	(0.013)	(0.016)**
	Intra-Industry	0.058	-0.017	0.030	0.075	0.017	0.024	0.077
		(0.039)	(0.040)	(0.040)	(0.040)	(0.037)	(0.031)	(0.050)
	Patent	-0.025	-0.026	-0.020	-0.024	-0.024	-0.026	-0.023
		(0.012)*	(0.012)*	(0.011)	(0.011)*	(0.011)*	(0.011)*	(0.011)*
	Patent (-1)	0.002	0.013	0.015	0.013	0.010	0.006	0.012
		(0.019)	(0.018)	(0.018)	(0.019)	(0.018)	(0.018)	(0.019)
	Patent (-2)	0.053	0.017	0.005	0.006	0.024	0.038	0.014
		(0.037)	(0.036)	(0.036)	(0.036)	(0.036)	(0.036)	(0.036)
	Patent (-3)	-0.016	-0.031	-0.014	-0.019	-0.014	0.001	-0.011
		(0.051)	(0.053)	(0.051)	(0.051)	(0.053)	(0.052)	(0.052)
	Patent (-4)	0.011	-0.001	-0.021	-0.011	-0.007	-0.003	-0.006
		(0.048)	(0.049)	(0.049)	(0.049)	(0.049)	(0.049)	(0.048)
	Patent (-5)	-0.096	-0.095	-0.103	-0.097	-0.102	-0.105	-0.103
		(0.049)*	(0.048)*	(0.048)*	(0.048)*	(0.050)*	(0.049)*	(0.050)*
Obs		1104	1104	1104	1104	1104	1104	1104
Adjusted R-squared		0.9934	0.9933	0.9934	0.9935	0.9931	0.9934	0.9932
F-stat (political econ)		3.59	5.28	4.58	5.83	2.80	4.61	5.67
F-stat (new product)		2.31	2.14	2.27	3.02	1.72	1.98	3.26
Ind. fixed effects?		yes	yes	yes	yes	yes	yes	yes
Time fixed effects?		yes	yes	yes	yes	yes	yes	yes

Note: Dependent variable is ln(number of tariff lines). Variables are weighted by number of votes each country has in the Council of Ministers (see Table 4-1). Panel regressions were run for 92 industries over 12 years (1988-1999). Heteroskedasticity-consistent standard errors are in parenthesis. Estimates marked ** are significant at the 1-percent level; those marked * are significant at the 5-percent level. All variables are in logs, with the exception of the change in import penetration and the Uruguay trade round dummy (which equals 1 starting in 1993). The estimated equations also include a full set of industry and year dummies. Each column consists of one regression, with the headings indicating the voting model. Lowest and highest refer to the models testing unanimity; median tests the median-voter model; QMV tests the qualified-majority voting requirement (equivalent to the 71st percentile); and the 60th and 80th percentiles refer to the logrolling models. The EU-wide regression tests the hypothesis that the EU is acting as a country when setting tariffs. See Table 4-2 for sources.

CHAPTER 5
SUMMARY AND CONCLUSIONS

This dissertation developed a novel test of different political-economy models and applied it to examine various aspects of the European Union's tariff policy. Chapter 2 sought to determine which model best describes tariff determination in the European Community. In particular, it used existing political-economy models to present a framework for examining how tariffs are set in the European Community, using both the political support function and the direct democracy approaches to formulate an empirical test. This procedure consisted of regressing the political-economy variables of the decisive country under each specification against the tariff rate. These specifications included the median (to reflect majority voting); the 71^{st} percentile (to reflect the qualified majority voting rule used in the EC); the lowest and the highest point in the distribution (to reflect unanimity); and the 60^{th} and 80^{th} percentiles, to reflect logrolling. The decisive country was the one whose industry characteristics lay at the relevant percentile. Equations using the mean characteristics were also estimated. Two specifications were used: unweighted independent variables, and weighted by the share of votes a country has in the Council of Ministers.

Empirical results suggested that decisions have been made around the highest percentile, possibly indicating that some logrolling did occur. The data also implied that changes in the European common tariff during the 1969-89 period were best explained by the share of employment, the number of firms, the change in import penetration, the export share and the Tokyo Round. These results were robust to eliminating potentially endogenous variables, to using simple averages rather than import-weighted tariffs, restricting the sample period, excluding industries that included specific tariffs in addition to *ad valorem* tariffs, excluding all the trade variables, changing the functional form, and

including time fixed-effects instead of a Tokyo Round dummy. The results were also robust to using different methods to find the decisive country. The first approach, which I dubbed the "bivariate method," consisted of determining which variable had the most explanatory variable by regressing tariffs against each of the industry characteristics. The decisive country was then the one whose most important industry characteristic lay at the relevant percentile. For the second method, the "preferred tariff method," I used a regression explaining pre-EC country-specific tariff rates to predict each country's preferred tariff rate, or the tariff the country would levy if it were not part of the customs union, based on the 1969-89 industry data. I then used these predictions to order each country based on their policy preferences, so that the decisive country became the one whose preferred tariff rate lay at the appropriate percentile. In both cases, I found the decisive country for each industry-year and each voting rule and then re-estimated the models. Again, the highest percentile model best explained the observed tariff rates.

The study also attempted to find how the decisive country changed over time, to determine whether those changes were due to shifts in the distribution or to the enlargements themselves. I ranked countries by their preferred tariff rates, since the preferred tariff method provided the best fit—and focused on the highest percentile voting rule. First I examined two industries where lobbying is prevalent, iron and steel and the knitting Industry, then I performed the analysis after averaging all preferred tariffs across industries. The results provide evidence of shifts in the political equilibrium due to shifts in the location of existing member countries in the distribution and to the entry of new countries at the top of the distribution. The results also suggest that despite the enlargements, large countries have still remained decisive, so that their preferences are the ones that determine the EC tariff rates.

The methods developed in this also enabled me to determine whether the common tariff is higher or lower than the tariffs each country would have levied if it were not part of the customs union. After plotting the average common tariff along with each country's

average preferred tariff rate, as predicted in one of the methods described above, over the 1969-89 period, I found that having a customs union did indeed result in the EC levying higher tariffs than it would otherwise have had, as each country's preferred tariff rate has been lower than the common tariff. This then supports the view that the EC has been exercising greater market power with each enlargement.

Chapter 3 sought to empirically test the hypothesis that since 1987, as a result of more rapid integration, the EU has become more like a single unified country. If the EU is behaving like a group of countries, this procedure consisted of regressing the political-economy variables of the decisive country under each voting rule against the tariff rate, as in the previous chapter. These decisive country models were compared to one reflecting pan-European lobbying, which would be the result of increased integration. In this case, each country's industry characteristics are aggregated to the EU level.

Empirical results confirm anecdotal evidence suggesting an increased drift to Brussels, as the EU-specification performed better than any of the decisive country voting models. The data also implied that changes in the European common tariff during the 1987-99 period were best explained by the number of firms, the wage rate, the labor cost share and the import penetration. These results were robust to eliminating potentially endogenous variables, to using simple averages rather than import-weighted tariffs, restricting the sample period, changing the functional form and including time fixed-effects instead of a Uruguay Round dummy. The results were also robust to using different methods to find the decisive country.

Finally, Chapter 4 took a first pass at explaining changes in the EU's tariff classification, and exploring whether they arise out of political-economy considerations, as the anecdotal evidence seems to suggest, or merely from the introduction of new products into the market. Customs classification is an important element in a country's trade policy. How a good is classified can affect the rate of duty that applies, the coverage of non-tariff barriers and the formulation and application of rules of origin. The

nomenclature can also impact multilateral agreement. Tariff reduction are negotiated on a range of products, and the decision as to whether the tariff on a particular good should be reduced depends on whether the good falls within the list. Whether the product belongs in the list in turn depends on the country's customs nomenclature.

If changes to the CN are a result of lobbying pressure from protectionist interests and it is assumed that any changes result in greater protection for the industry involved, it becomes possible to model the decision-making process in the same way as tariff determination. Given how decisions are made, interest groups can have two potential channels of influence: their national governments or the European Commission. To determine whether changes in the CN result from lobbying with the intent of increasing protection or merely from the existence of new products in the market, I test a model that includes political-economy characteristics and the number of total patent applications in the U.S. (which proxy for the introduction of new products) against one with only the political-economy characteristics and one with only the new-product hypothesis. To account for the different decision rules, I perform the same test for each possible voting rule. If firms are lobbying their national governments, so that the EU is behaving like a group of countries, this procedure consisted of regressing the political-economy variables of the decisive country under each voting rule against the tariff rate, as in previous chapters. To reflect the possibility of pan-European lobbying, I also include a model in which each country's industry characteristics are aggregated to the EU level. The analysis uses a dataset containing 92 manufacturing industries covering the 1988-1999 period, which includes one official enlargement in 1995 and the unification of Germany in 1990, which could also be considered an enlargement. An advantage of using panel data in this case is that these enlargements provide for an additional source of variation. Because we do not observe how countries vote on changes in the classification, it becomes necessary to examine the issue empirically.

Empirical results suggest that changes in the EU's customs classification does indeed reflect protectionist lobbying pressures. These results are robust to how protection is defined and also to the estimation procedure.

In short, my dissertation serves to cast light on how tariffs are determined in the EU. It also provides evidence on another instrument of protection that has been largely ignored in the literature, namely, the way goods are classified in the customs nomenclature..

APPENDIX A
SUPPLEMENTARY TABLES TO CHAPTER 2

Table A-1—Three-Digit NACE Industries

NACE	Description
110	Extraction and briquetting of solid fuels
140	Mineral oil refining
161	Generation and distribution of electric power (for public supply)
162	Gasworks; gas distribution
170	Water supply: collection, purification and distribution of
212	Extraction and preparation of non-ferrous metal ores
221	Iron and steel industry (as defined in the e.c.s.c. Treaty), excluding integrated coke ovens
222	Manufacture of steel tubes
223	Drawing, cold rolling and cold folding of steel
224	Production and preliminary processing of non-ferrous metals
231	Extraction of building materials and refractory clays
232	Mining of potassium salt and natural phosphates
241	Manufacture of clay products for constructional purposes
242	Manufacture of cement, lime and plaster
243	Manufacture of concrete, cement or plaster products for constructional purposes
245	Working of stone and of non-metallic mineral products
246	Production of grindstones and other abrasive products
247	Manufacture of glass and glassware
248	Manufacture of ceramic goods
255	Manufacture of paint, painters' fillings, varnish and printing ink
256	Manufacture of other chemical products, mainly for industrial and agricultural purposes
257	Manufacture of pharmaceutical products
258	Manufacture of soap, synthetic detergents, perfume and toilet preparations
259	Manufacture of other chemical products, chiefly for household and office use
260	Man-made fibres industry
311	Foundries
312	Forging; drop forging, closed die-forging, pressing and stamping
313	Secondary transformation, treatment and coating of metals
314	Manufacture of structural metal products (incl. integrated assembly and installation)
315	Boilermaking, manufacture of reservoirs, tanks and other sheet-metal containers
316	Manufacture of tools and finished metal goods, except electrical equipment
321	Manufacture of agricultural machinery and tractors
322	Manufacture of machine-tools for working metal, and of other tools and equipment for use with machines
323	Manufacture of textile machinery and accessories; manufacture of sewing machines
324	Manufacture of machinery for the food, chemical and related industries
325	Manufacture of plant for mines, the iron and steel industry and foundries, civil engineering and the building trade; manufacture of mechanical handling equipment

Table A-1—Continued

NACE	Description
326	Manufacture of transmission equipment for motive power
327	Manufacture of other machinery and equipment for use in specific branches of industry
328	Manufacture of other machinery and equipment
330	Manufacture of office machinery and data processing machinery
341	Manufacture of insulated wires and cables
342	Manufacture of electrical machinery (comprising electric motors, electricity' generators, transformers, switches, switchgear and other basic electrical plant)
343	Manufacture of electrical apparatus and appliances for industrial use; manufacture of batteries and accumulators
344	Manufacture of telecommunications equipment, electrical and electronic measuring and recording equipment, and electro-medical equipment
345	Manufacture of radio and television receiving sets, sound reproducing and recording equipment and of electronic equipment and apparatus (except electronic computers); manufacture of gramophone records and prerecorded magnetic tapes
346	Manufacture of domestic type electric appliances
347	Manufacture of electric lamps and other electric lighting equipment
351	Manufacture and assembly of motor vehicles (including road tractors) and manufacture of motor vehicle engines
352	Manufacture of bodies for motor vehicles and of motor-drawn trailers and caravans
353	Manufacture of parts and accessories for motor vehicles
361	Shipbuilding
362	Manufacture of standard and narrow-gauge railway and tramway rolling-stock
363	Manufacture of cycles, motor-cycles and parts and accessories thereof
364	Aerospace equipment manufacturing and repairing
371	Manufacture of measuring, checking and precision instruments and apparatus
372	Manufacture of medical and surgical equipment and orthopaedic appliances (except orthopaedic footwear)
373	Manufacture of optical instruments and photographic equipment
374	Manufacture of clocks and watches and parts thereof
411	Manufacture of vegetable and animal oils and fats
412	Slaughtering, preparing and preserving of meat (except the butchers' trade)
413	Manufacture of dairy products
414	Processing and preserving of fruit and vegetables
415	Processing and preserving of fish and other sea foods fit for human consumption
416	Grain milling
417	Manufacture of spaghetti, macaroni, etc.
418	Manufacture of starch and starch products
419	Bread and flour confectionery
420	Sugar manufacturing and refining
421	Manufacture of cocoa, chocolate and sugar confectionery
422	Manufacture of animal and poultry foods (including fish meal and flour)
423	Manufacture of other food products
427	Brewing and malting
428	Manufacture of soft drinks, including the bottling of natural spa waters
429	Manufacture of tobacco products
436	Knitting industry
438	Manufacture of carpets, linoleum and other floor coverings, including leathercloth and similar supported synthetic sheeting

Table A-1—Continued

NACE	Description
438	Manufacture of carpets, linoleum and other floor coverings, including leathercloth and similar supported synthetic sheeting
439	Miscellaneous textile industries
441	Tanning and dressing of leather
442	Manufacture of products from leather and leather substitutes
451	Manufacture of mass-produced footwear (excluding footwear made completely of wood or of rubber)
453	Manufacture of ready-made clothing and accessories
455	Manufacture of household textiles and other made-up textile goods (outside weaving-mills)
456	Manufacture of furs and of fur goods
461	Sawing and processing of wood
462	Manufacture of semi-finished wood products
463	Manufacture of carpentry and joinery components and of parquet flooring
464	Manufacture of wooden containers
465	Other wood manufactures (except furniture)
466	Manufacture of articles of cork and articles of straw and other plaiting materials (including basketware and wickerwork); manufacture of brushes
467	Manufacture of wooden furniture
471	Manufacture of pulp, paper and board
472	Processing of paper and board
473	Printing and allied industries
481	Manufacture of rubber products
482	Retreading and repairing of rubber tyres
483	Processing of plastics
491	Manufacture of articles of jewellery and goldsmiths' and silversmiths' wares; cutting or otherwise working of precious and semi-precious stones
492	Manufacture of musical instruments
493	Photographic and cinematographic laboratories
494	Manufacture of toys and sports goods
495	Miscellaneous manufacturing industries

Table A-2—Unweighted J and P_E Specification Tests

Null	Alternative	Model	t-stat	Conclusion
Lin-Log	Linear	Lowest	0.14	Cannot Reject
		Means	3.45**	Reject
		Median	2.15*	Reject
		60th Pctile	1.17	Cannot Reject
		QMV	0.09	Cannot Reject
		80th Pctile	1.14	Cannot Reject
		Highest	1.85*	Reject
	Log	Lowest	2.23*	Reject
		Means	1.21	Cannot Reject
		Median	0.49	Cannot Reject
		60th Pctile	1.72*	Reject
		QMV	1.21	Cannot Reject
		80th Pctile	1.47	Cannot Reject
		Highest	0.85	Cannot Reject
Log	Linear	Lowest	0.78	Cannot Reject
		Means	2.65**	Reject
		Median	2.31*	Reject
		60th Pctile	2.18*	Reject
		QMV	1.04	Cannot Reject
		80th Pctile	0.18	Cannot Reject
		Highest	1.28	Cannot Reject
	Lin-Log	Lowest	1.03	Cannot Reject
		Means	2.51**	Reject
		Median	1.73*	Reject
		60th Pctile	2.35**	Reject
		QMV	1.99*	Reject
		80th Pctile	3.12**	Reject
		Highest	2.11*	Reject
Linear	Lin-Log	Lowest	3.08**	Reject
		Means	3.07**	Reject
		Median	1.84*	Reject
		60th Pctile	1.69*	Reject
		QMV	3.81**	Reject
		80th Pctile	3.58**	Reject
		Highest	3.78**	Reject
	Log	Lowest	3.07**	Reject
		Means	2.70**	Reject
		Median	1.43	Cannot Reject
		60th Pctile	0.43	Cannot Reject
		QMV	2.78**	Reject
		80th Pctile	2.78**	Reject
		Highest	3.45**	Reject

Note: * denotes significance at the 5 percent level and ** at the 1 percent level. Lin-log refers to a specification where the dependent variable (tariff) is linear but the independent variables are in logs. Log refers to a specification where all variables, are in logs, whereas in Linear, no variables are in logs. Each row denotes a voting model. Lowest and highest refer to the models testing unanimity; median tests the median-voter model; QMV tests the qualified-majority voting requirement (equivalent to the 71st percentile); and the 60th and 80th percentiles refer to the logrolling models. The mean regression is included for reference.

Table A-3—Weighted J and P_E Specification Tests

Null	Alternative	Model	t-stat	Conclusion
Lin-Log	Linear	Lowest	0.14	Cannot Reject
		Means	3.45**	Reject
		Median	2.15*	Reject
		60th Pctile	1.17	Cannot Reject
		QMV	0.09	Cannot Reject
		80th Pctile	1.14	Cannot Reject
		Highest	1.85*	Reject
	Log	Lowest	2.23*	Reject
		Means	1.21	Cannot Reject
		Median	0.49	Cannot Reject
		60th Pctile	1.72*	Reject
		QMV	1.21	Cannot Reject
		80th Pctile	1.47	Cannot Reject
		Highest	0.85	Cannot Reject
Log	Linear	Lowest	0.78	Cannot Reject
		Means	3.02**	Reject
		Median	2.86**	Reject
		60th Pctile	5.39**	Reject
		QMV	2.59**	Reject
		80th Pctile	0.73	Cannot Reject
		Highest	1.28	Cannot Reject
	Lin-Log	Lowest	1.03	Cannot Reject
		Means	2.51**	Reject
		Median	1.73*	Reject
		60th Pctile	2.35**	Reject
		QMV	1.99*	Reject
		80th Pctile	3.12**	Reject
		Highest	2.11*	Reject
Linear	Lin-Log	Lowest	3.08**	Reject
		Means	3.07**	Reject
		Median	1.84*	Reject
		60th Pctile	1.69*	Reject
		QMV	3.81**	Reject
		80th Pctile	3.58**	Reject
		Highest	3.78**	Reject
	Log	Lowest	3.07**	Reject
		Means	2.17*	Reject
		Median	0.14	Cannot Reject
		60th Pctile	0.29	Cannot Reject
		QMV	1.00	Cannot Reject
		80th Pctile	1.78*	Reject
		Highest	3.45**	Reject

Note: * denotes significance at the 5 percent level and ** at the 1 percent level. Lin-log refers to a specification where the dependent variable (tariff) is linear but the independent variables are in logs. Log refers to a specification where all variables, dependent and independent are in logs, whereas in Linear, no variables are in logs. Each row denotes a voting model. Lowest and highest refer to the models testing unanimity; median tests the median-voter model; QMV tests the qualified-majority voting requirement (equivalent to the 71st percentile); and the 60th and 80th percentiles refer to the logrolling models. The mean regression is included for reference.

APPENDIX B
SUPPLEMENTARY TABLES TO CHAPTER 3

Table B-1—Three-Digit NACE Revision 1 Industries

NACE Rev. 1	Description
141	Quarrying of stone
142	Quarrying of sand and clay
145	Other mining and quarrying nec
151	Production, processing and preserving of meat and meat products
152	Processing and preserving of fish and fish products
153	Processing and preserving of fruit and vegetables
154	Manufacture of vegetable and animal oils and fats
155	Manufacture of dairy products
156	Manufacture of grain mill products, starches and starch products
157	Manufacture of prepared animal feeds
158	Manufacture of other food products
159	Manufacture of beverages
160	Manufacture of tobacco products
171	Preparation and spinning of textile fibres
172	Textile weaving
174	Manufacture of made-up textile articles, except apparel
175	Manufacture of other textiles
177	Manufacture of knitted and crocheted articles
183	Dressing and dyeing of fur; manufacture of articles of fur
191	Tanning and dressing of leather
192	Manufacture of luggage, handbags and the like, saddlery and harness
193	Manufacture of footwear
201	Sawmilling and planing of wood; impregnation of wood
202	Manufacture of veneer sheets; manufacture of plywood, laminboard, particle board, fibre board and other panels and boards
203	Manufacture of builders' carpentry and joinery
204	Manufacture of wooden containers
205	Manufacture of other products of wood; manufacture of articles of cork, straw and plaiting materials
211	Manufacture of pulp, paper and paperboard
212	Manufacture of articles of paper and paperboard
221	Publishing
222	Printing and service activities related to printing
232	Manufacture of refined petroleum products
241	Manufacture of basic chemicals
242	Manufacture of pesticides and other agro-chemical products
243	Manufacture of paints, varnishes and similar coatings, printing ink and mastics
244	Manufacture of pharmaceuticals, medicinal chemicals and botanical products

Table B-1—Continued

NACE Rev. 1	Description
245	Manufacture of soap and detergents, cleaning and polishing preparations, perfumes and toilet preparations
246	Manufacture of other chemical products
247	Manufacture of man-made fibres
251	Manufacture of rubber products
252	Manufacture of plastic products
261	Manufacture of glass and glass products
262	Manufacture of non-refractory ceramic goods other than for construction purposes; manufacture of refractory ceramic products
264	Manufacture of bricks, tiles and construction products, in baked clay
265	Manufacture of cement, lime and plaster
266	Manufacture of articles of concrete, plaster and cement
267	Cutting, shaping and finishing of stone
268	Manufacture of other non-metallic mineral products
271	Manufacture of basic iron and steel and of ferro-alloys (ECSC)
272	Manufacture of tubes
273	Other first processing of iron and steel and production of non-ECSC ferro-alloys
274	Manufacture of basic precious and non-ferrous metals
281	Manufacture of structural metal products
282	Manufacture of tanks, reservoirs and containers of metal; manufacture of central heating radiators and boilers
283	Manufacture of steam generators, except central heating hot water boilers
286	Manufacture of cutlery, tools and general hardware
287	Manufacture of other fabricated metal products
291	Manufacture of machinery for the production and use of mechanical power, except aircraft, vehicle and cycle engines
292	Manufacture of other general purpose machinery
293	Manufacture of agricultural and forestry machinery
294	Manufacture of machine-tools
295	Manufacture of other special purpose machinery
296	Manufacture of weapons and ammunition
297	Manufacture of domestic appliances nec
300	Manufacture of office machinery and computers
311	Manufacture of electric motors, generators and transformers
312	Manufacture of electricity distribution and control apparatus
313	Manufacture of insulated wire and cable
314	Manufacture of accumulators, primary cells and primary batteries
315	Manufacture of lighting equipment and electric lamps
316	Manufacture of electrical equipment nec
321	Manufacture of electronic valves and tubes and other electronic components
322	Manufacture of television and radio transmitters and apparatus for line telephony and line telegraphy
323	Manufacture of television and radio receivers, sound or video recording or reproducing apparatus and associated goods
331	Manufacture of medical and surgical equipment and orthopaedic appliances

Table B-1—Continued

NACE Rev. 1	Description
332	Manufacture of instruments and appliances for measuring, checking, testing, navigating and other purposes, except industrial process control equipment
334	Manufacture of optical instruments and photographic equipment
335	Manufacture of watches and clocks
341	Manufacture of motor vehicles
342	Manufacture of bodies (coachwork) for motor vehicles; manufacture of trailers and semi-trailers
343	Manufacture of parts and accessories for motor vehicles and their engines
351	Building and repairing of ships and boats
352	Manufacture of railway and tramway locomotives and rolling stock
353	Manufacture of aircraft and spacecraft
354	Manufacture of motorcycles and bicycles
355	Manufacture of other transport equipment nec
361	Manufacture of furniture
362	Manufacture of jewellery and related articles
363	Manufacture of musical instruments
364	Manufacture of sports goods
365	Manufacture of games and toys
366	Miscellaneous manufacturing nec
401	Production and distribution of electricity
402	Manufacture of gas; distribution of gaseous fuels through mains

Table B-2—Unweighted J and P_E Specification Tests

Null	Alternative	Model	t-stat	Conclusion
Linear	Log	Lowest	4.27**	Reject
		Median	0.54	Cannot Reject
		60th Pctile	3.06**	Reject
		QMV	4.41**	Reject
		80th Pctile	2.58**	Reject
		Highest	3.93**	Reject
		EU	4.35**	Reject
	Lin-log	Lowest	0.45	Cannot Reject
		Median	0.05	Cannot Reject
		60th Pctile	1.59	Cannot Reject
		QMV	1.54	Cannot Reject
		80th Pctile	0.51	Cannot Reject
		Highest	1.84*	Reject
		EU	1.24	Cannot Reject
Log	Linear	Lowest	2.88**	Reject
		Median	0.25	Cannot Reject
		60th Pctile	2.33*	Reject
		QMV	3.15**	Reject
		80th Pctile	1.39	Cannot Reject
		Highest	1.07	Cannot Reject
		EU	2.49**	Reject
	Lin-log	Lowest	2.29*	Reject
		Median	0.96	Cannot Reject
		60th Pctile	0.43	Cannot Reject
		QMV	1.72*	Reject
		80th Pctile	2.55**	Reject
		Highest	0.06	Cannot Reject
		EU	2.58**	Reject
Lin-log	Linear	Lowest	2.93**	Reject
		Median	1.43	Cannot Reject
		60th Pctile	2.79**	Reject
		QMV	2.71**	Reject
		80th Pctile	1.39	Cannot Reject
		Highest	2.10*	Reject
		EU	2.59**	Reject
	Log	Lowest	2.96**	Reject
		Median	1.92*	Reject
		60th Pctile	2.29*	Reject
		QMV	2.31*	Reject
		80th Pctile	2.11*	Reject
		Highest	2.08*	Reject
		EU	2.93**	Reject

Note: * denotes significance at the 5 percent level and ** at the 1 percent level. Lin-log refers to a specification where the dependent variable (tariff) is linear but the independent variables are in logs. Log refers to a specification where all variables, dependent and independent are in logs, whereas in Linear, no variables are in logs. Each row denotes a voting model. Lowest and highest refer to the models testing unanimity; median tests the median-voter model; QMV tests the qualified-majority voting requirement (equivalent to the 71ST percentile); and the 60th and 80th percentiles refer to the logrolling models. The EU regression tests the hypothesis that the EU is acting as a country when setting tariffs.

Table B-3—Weighted J and P_E Specification Tests

Null	Alternative	Model	t-stat	Conclusion
Linear	Log	Lowest	4.37**	Reject
		Median	3.19**	Reject
		60th Pctile	1.69*	Reject
		QMV	3.24**	Reject
		80th Pctile	1.72*	Reject
		Highest	3.93**	Reject
		EU	4.35**	Reject
	Lin-log	Lowest	0.14	Cannot Reject
		Median	3.77**	Reject
		60th Pctile	0.33	Cannot Reject
		QMV	2.13*	Reject
		80th Pctile	0.23	Cannot Reject
		Highest	1.84*	Reject
		EU	1.24	Cannot Reject
Log	Linear	Lowest	3.01**	Reject
		Median	2.94**	Reject
		60th Pctile	1.04	Cannot Reject
		QMV	0.77	Cannot Reject
		80th Pctile	1.79*	Reject
		Highest	1.07	Cannot Reject
		EU	2.49**	Reject
	Lin-log	Lowest	2.48**	Reject
		Median	1.39	Cannot Reject
		60th Pctile	0.91	Cannot Reject
		QMV	1.63	Cannot Reject
		80th Pctile	2.13*	Reject
		Highest	0.06	Cannot Reject
		EU	2.58**	Reject
Lin-log	Log	Lowest	3.08**	Reject
		Median	2.02*	Reject
		60th Pctile	2.49**	Reject
		QMV	0.7	Cannot Reject
		80th Pctile	0.77	Cannot Reject
		Highest	2.08*	Reject
		EU	2.93**	Reject
	Linear	Lowest	2.82**	Reject
		Median	2.05*	Reject
		60th Pctile	2.52**	Reject
		QMV	2.19*	Reject
		80th Pctile	0.95	Cannot Reject
		Highest	2.10*	Reject
		EU	2.59**	Reject

Note: * denotes significance at the 5 percent level and ** at the 1 percent level. Lin-log refers to a specification where the dependent variable (tariff) is linear but the independent variables are in logs. Log refers to a specification where all variables, dependent and independent are in logs, whereas in Linear, no variables are in logs. Each row denotes a voting model. Lowest and highest refer to the models testing unanimity; median tests the median-voter model; QMV tests the qualified-majority voting requirement (equivalent to the 71ST percentile); and the 60th and 80th percentiles refer to the logrolling models. The EU regression tests the hypothesis that the EU is acting as a country when setting tariffs.

APPENDIX C
SUPPLEMENTARY TABLE TO CHAPTER 4

Table C-1—Three-Digit NACE Rev. 1 Industries

NACE Rev 1	Description
141	Quarrying of stone
142	Quarrying of sand and clay
145	Other mining and quarrying nec
151	Production, processing and preserving of meat and meat products
152	Processing and preserving of fish and fish products
153	Processing and preserving of fruit and vegetables
154	Manufacture of vegetable and animal oils and fats
155	Manufacture of dairy products
156	Manufacture of grain mill products, starches and starch products
157	Manufacture of prepared animal feeds
158	Manufacture of other food products
159	Manufacture of beverages
160	Manufacture of tobacco products
171	Preparation and spinning of textile fibres
172	Textile weaving
174	Manufacture of made-up textile articles, except apparel
175	Manufacture of other textiles
177	Manufacture of knitted and crocheted articles
183	Dressing and dyeing of fur; manufacture of articles of fur
191	Tanning and dressing of leather
192	Manufacture of luggage, handbags and the like, saddlery and harness
193	Manufacture of footwear
201	Sawmilling and planing of wood; impregnation of wood
202	Manufacture of veneer sheets; manufacture of plywood, laminboard, particle board, fibre board and other panels and boards
203	Manufacture of builders' carpentry and joinery
204	Manufacture of wooden containers
205	Manufacture of other products of wood; manufacture of articles of cork, straw and plaiting materials
211	Manufacture of pulp, paper and paperboard
212	Manufacture of articles of paper and paperboard
221	Publishing
222	Printing and service activities related to printing
232	Manufacture of refined petroleum products
241	Manufacture of basic chemicals
242	Manufacture of pesticides and other agro-chemical products
243	Manufacture of paints, varnishes and similar coatings, printing ink and mastics
244	Manufacture of pharmaceuticals, medicinal chemicals and botanical products

Table C-1—Continued

NACE Rev 1	Description
245	Manufacture of soap and detergents, cleaning and polishing preparations, perfumes and toilet preparations
246	Manufacture of other chemical products
251	Manufacture of rubber products
252	Manufacture of plastic products
261	Manufacture of glass and glass products
262	Manufacture of non-refractory ceramic goods other than for construction purposes; manufacture of refractory ceramic products
264	Manufacture of bricks, tiles and construction products, in baked clay
265	Manufacture of cement, lime and plaster
266	Manufacture of articles of concrete, plaster and cement
267	Cutting, shaping and finishing of stone
268	Manufacture of other non-metallic mineral products
271	Manufacture of basic iron and steel and of ferro-alloys (ECSC)
272	Manufacture of tubes
273	Other first processing of iron and steel and production of non-ECSC ferro-alloys
274	Manufacture of basic precious and non-ferrous metals
281	Manufacture of structural metal products
282	Manufacture of tanks, reservoirs and containers of metal; manufacture of central heating radiators and boilers
283	Manufacture of steam generators, except central heating hot water boilers
286	Manufacture of cutlery, tools and general hardware
287	Manufacture of other fabricated metal products
291	Manufacture of machinery for the production and use of mechanical power, except aircraft, vehicle and cycle engines
292	Manufacture of other general purpose machinery
293	Manufacture of agricultural and forestry machinery
294	Manufacture of machine-tools
295	Manufacture of other special purpose machinery
296	Manufacture of weapons and ammunition
297	Manufacture of domestic appliances nec
300	Manufacture of office machinery and computers
311	Manufacture of electric motors, generators and transformers
312	Manufacture of electricity distribution and control apparatus
313	Manufacture of insulated wire and cable
314	Manufacture of accumulators, primary cells and primary batteries
316	Manufacture of electrical equipment nec
321	Manufacture of electronic valves and tubes and other electronic components
322	Manufacture of television and radio transmitters and apparatus for line telephony and line telegraphy
323	Manufacture of television and radio receivers, sound or video recording or reproducing apparatus and associated goods
331	Manufacture of medical and surgical equipment and orthopaedic appliances
332	Manufacture of instruments and appliances for measuring, checking, testing, navigating and other purposes, except industrial process control equipment
334	Manufacture of optical instruments and photographic equipment
335	Manufacture of watches and clocks
341	Manufacture of motor vehicles

Table C-1—Continued

NACE Rev. 1	Description
342	Manufacture of bodies (coachwork) for motor vehicles; manufacture of trailers and semi-trailers
343	Manufacture of parts and accessories for motor vehicles and their engines
351	Building and repairing of ships and boats
352	Manufacture of railway and tramway locomotives and rolling stock
353	Manufacture of aircraft and spacecraft
354	Manufacture of motorcycles and bicycles
355	Manufacture of other transport equipment nec
361	Manufacture of furniture
362	Manufacture of jewellery and related articles
363	Manufacture of musical instruments
364	Manufacture of sports goods
365	Manufacture of games and toys
366	Miscellaneous manufacturing nec
401	Production and distribution of electricity

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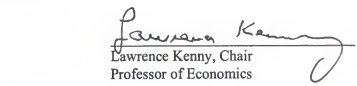

Lawrence Kenny, Chair
Professor of Economics

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Associate Professor of Economics

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This dissertation was submitted to the Graduate Faculty of the Department of Economics in the College of Business Administration and to the Graduate School and was accepted as partial fulfillment of the requirements for the degree of Doctor of Philosophy.

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